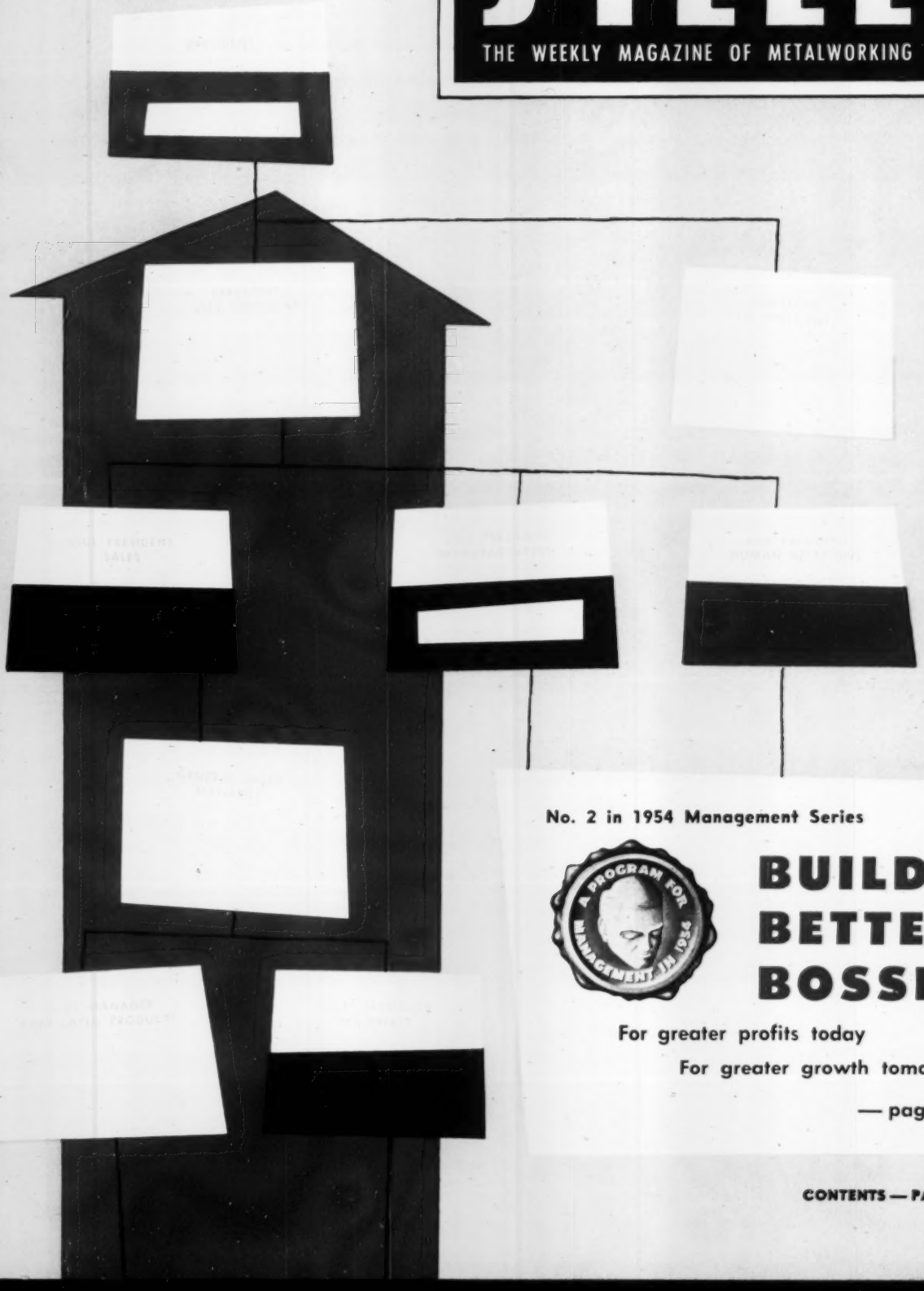
MARCH 22, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING



No. 2 in 1954 Management Series

BUILD BETTER BOSSES

For greater profits today

For greater growth tomorrow

— page 81

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WE HARNESS UNSEEN FORCES . . .

TO GIVE YOU GREATER LIFTING POWER!

The lifted load takes on a "new look" when you swing an EC&M Type SW ALL-WELDED MAGNET into operation. Each lift is wider . . . heavier . . . and a greater pay load.

This *greater* lifting power results from the EC&M all-welded design, which permits better space proportioning for magnet windings and eliminates load-limiting air gaps. When you turn on the current, invisible magnetic lines of force flow radially out from the center pole across the load and back into the magnet case through the outer pole ring. The magnetic path is constant . . . no air gaps at pole shoes.

Whether you are handling pig or scrap iron . . .or any other ferrous materials or products . . . there's an EC&M Type SW all-welded magnet to meet your individual requirements.

CHECK THESE FEATURES: EC&M Type SW all-welded magnets are sealed against moisture . . . inner and outer poles are welded for snug fit . . . pole pieces are renewable . . . wider working surface and bigger pay loads result from elimination of recesses for bolts . . . greater mechanical strength withstands rough handling and assures longer service life . . . maximum operating efficiency means substantial savings in time and results in top economy.

FOR DETAILS AND SPECIFICATIONS, WRITE TODAY FOR BULLETIN 900.

LIFT MORE FOR LESS WITH EC&M LIFTING MAGNETS!

1702

THE ELECTRIC CONTROLLER & MFG. CO.

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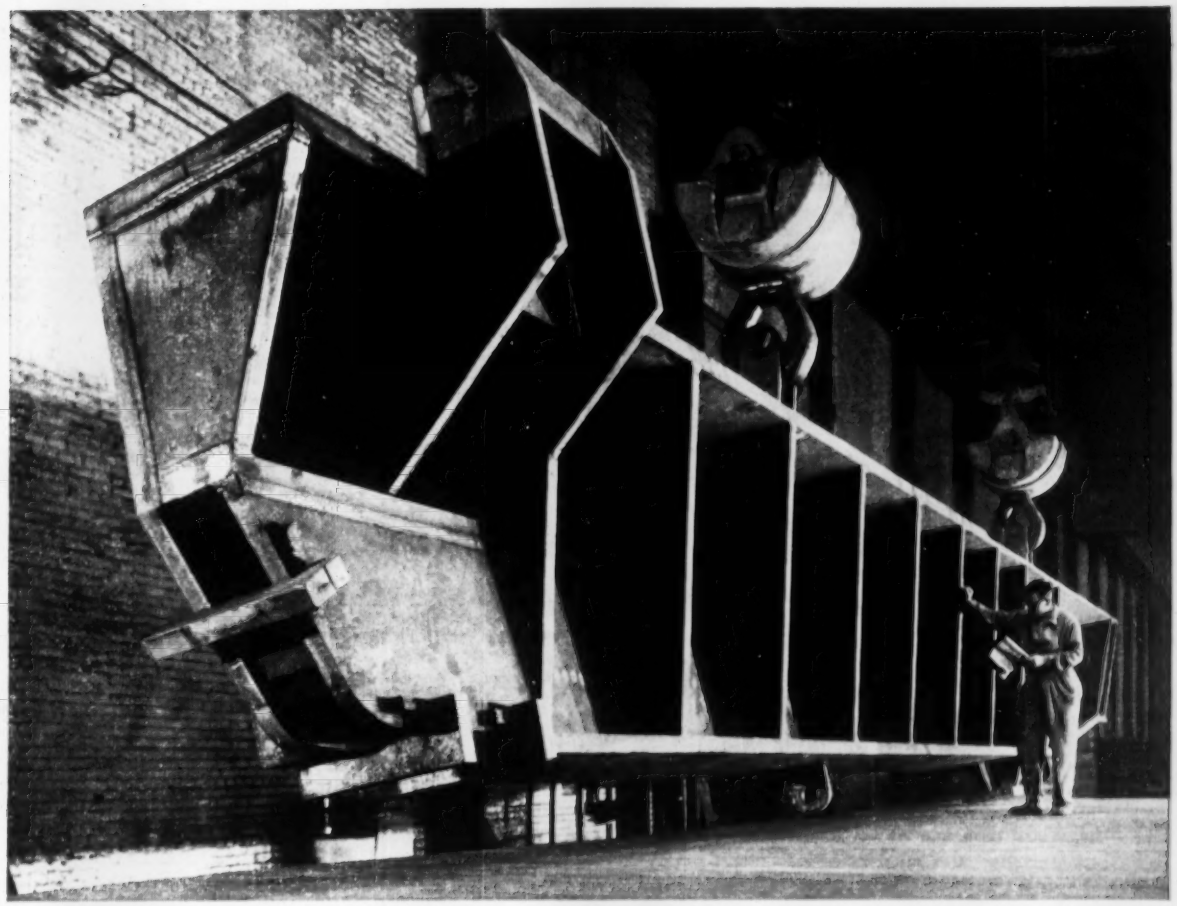
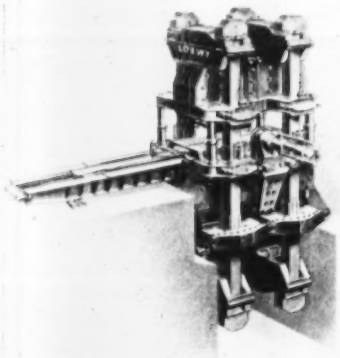


HUGE WELDMENT for 35,000-ton FORGING PRESS

Of tremendous importance to America's air might are the powerful die-forging presses now being constructed for the U. S. Air Force. One of these is the 35,000-ton capacity press, designed by Loewy-Hydropress, Inc., nearly double the capacity of the largest forging press now in service in this country.



Visualization of finished press, showing the 60-ft sliding table. The die bed will ride along the table in 30½-ft strokes. Design and construction by Loewy-Hydropress, Inc.

Rapid Production of Aircraft Parts

With a single gargantuan stroke, this giant press will form wing panels or main beams that formerly required many hours of tedious machining. The forged parts will be considerably stronger than if "hogged out" of solid blocks of metal.

The entire die-bed area and the metal being forged will ride on a slide table supported by two massive Bethlehem weldments. Each weighs 125,662 pounds and measures 60 ft by 6 ft by 4 ft, 8 in. They were fabricated from heavy rolled plates, up to 3 in. thick, in our Weldment Shop.

Weldments are Versatile, Economical

If you are in need of a machine part or finished assembly, simple or complex, small or large, we suggest you look into the possibility of using a Bethlehem Weldment. We can often save money for you by trimming off excess weight, without loss of strength or rigidity. What's more, we work directly from your blueprints, incorporating forgings, castings or structural shapes into the finished weldment, if desired. A letter or phone call to the nearest Bethlehem sales office will bring you further information.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM WELDMENTS

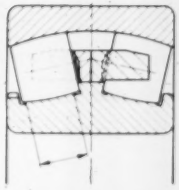
BETHLEHEM STEEL

the SKF

improvement of internal design of spherical roller bearings

Increases capacity 25% to 50%

increases service life 2 to 3½ times

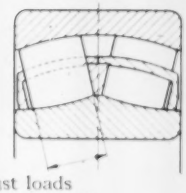


This is the Spherical Roller Bearing design originated by SKF *more than 30 years ago.* The cross-section shows how the integral inner ring flanges, and the undercuts adjacent thereto, limit the effective length of the rollers.

Now, SKF, originator of the Spherical Roller Bearing, has again provided industry with another anti-friction *first.*

This time, it's a revolutionary design advance in Series 222 and 223 bearings providing these advantages:

When designing new equipment, you can obtain the desired life by using smaller or lighter bearings at considerable cost saving. In addition, this forward step in design will carry heavier combinations of radial and thrust loads, or pure thrust loads of greater magnitude. The important self-aligning feature of SKF Spherical Roller Bearings has been preserved, so that considerable misalignment between the shaft and housing has no ill effect whatever on bearing capacity or life.



Here is the latest SKF improvement, a *revolutionary advance in design.* Effective roller guiding is accomplished by means of a separate ring. The need for undercuts is eliminated! This type of guide ring permits the rollers to take the position which their contact with the rings dictates. This assures uniform load distribution over the entire length of the longer rollers at all times. *Result* – greatly increased capacity and life.

During more than 4 years, thousands of installations have been made in railroad journals, vibrating screens, steel mill machinery and numerous other fields. In all cases performance has been outstanding.

SKF Sales Engineers in our District Offices throughout the country will assist you in making use of the important advantages of the improved internal design of SKF Spherical Roller Bearings. **SKF INDUSTRIES, INC.,** Dept. 616, PHILADELPHIA 32, PA.
– *manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.*

SKF®
BALL AND ROLLER BEARINGS

This 12-page booklet gives you additional facts – sizes available – added capacity, size by size – increased life you can expect for each size – dimensional tabulations – and load and speed data. Write now for your free copy of Booklet No. 365-2.

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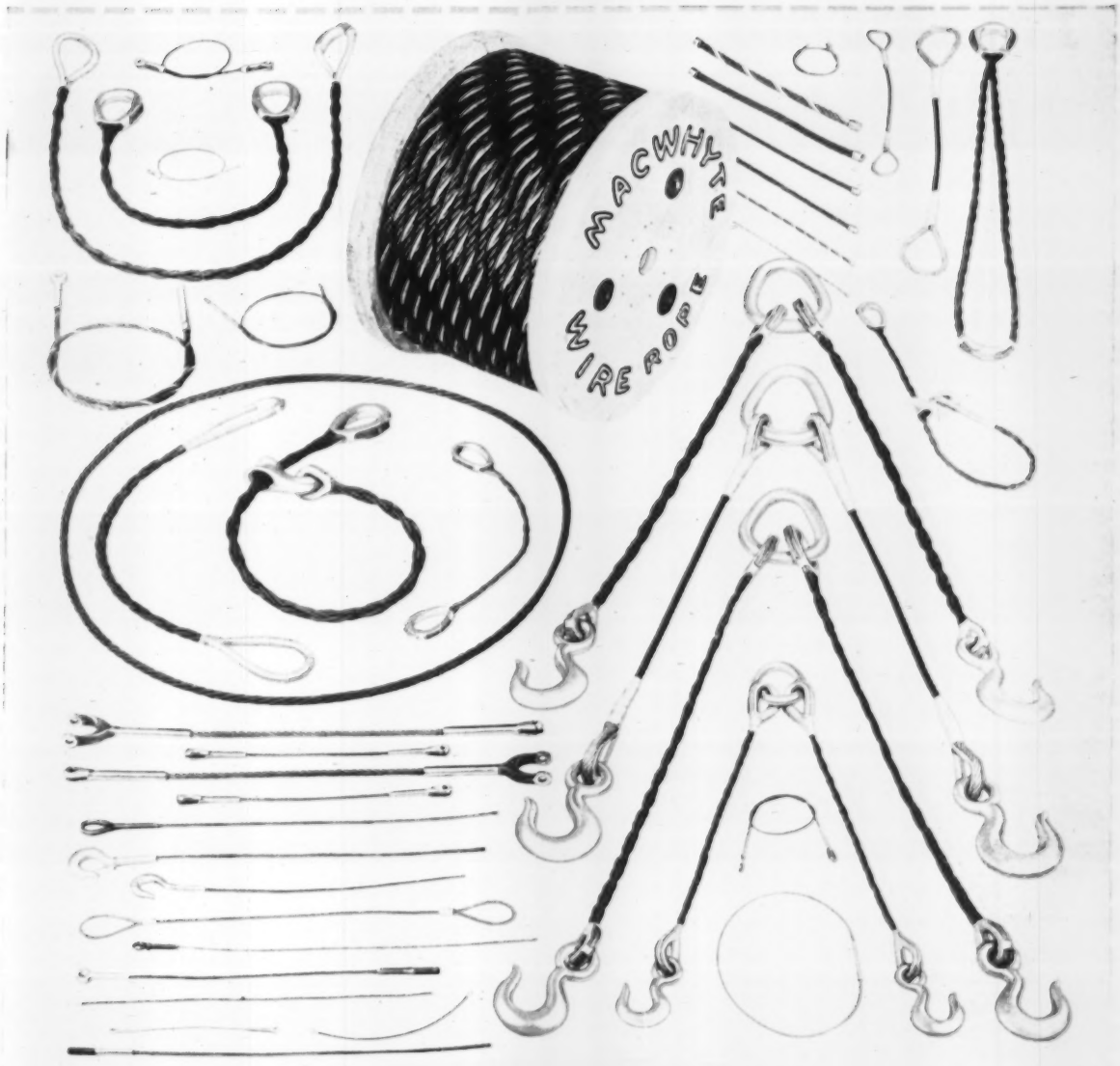

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Whatever your wire rope needs, you'll find that the best for your equipment is made by Macwhyte. A thousand and one types and sizes of wire rope are available in carbon steel, stainless steel, or monel metal. Also there are braided slings, assemblies, aircraft control cables, terminals, and tie rods.

There is a precision-engineered Macwhyte product for every handling job. The right specifications mean top operating efficiency. Get the most service from your wire rope products by consulting our engineers who will gladly share their special knowledge to save you time and money. Catalogs are available.

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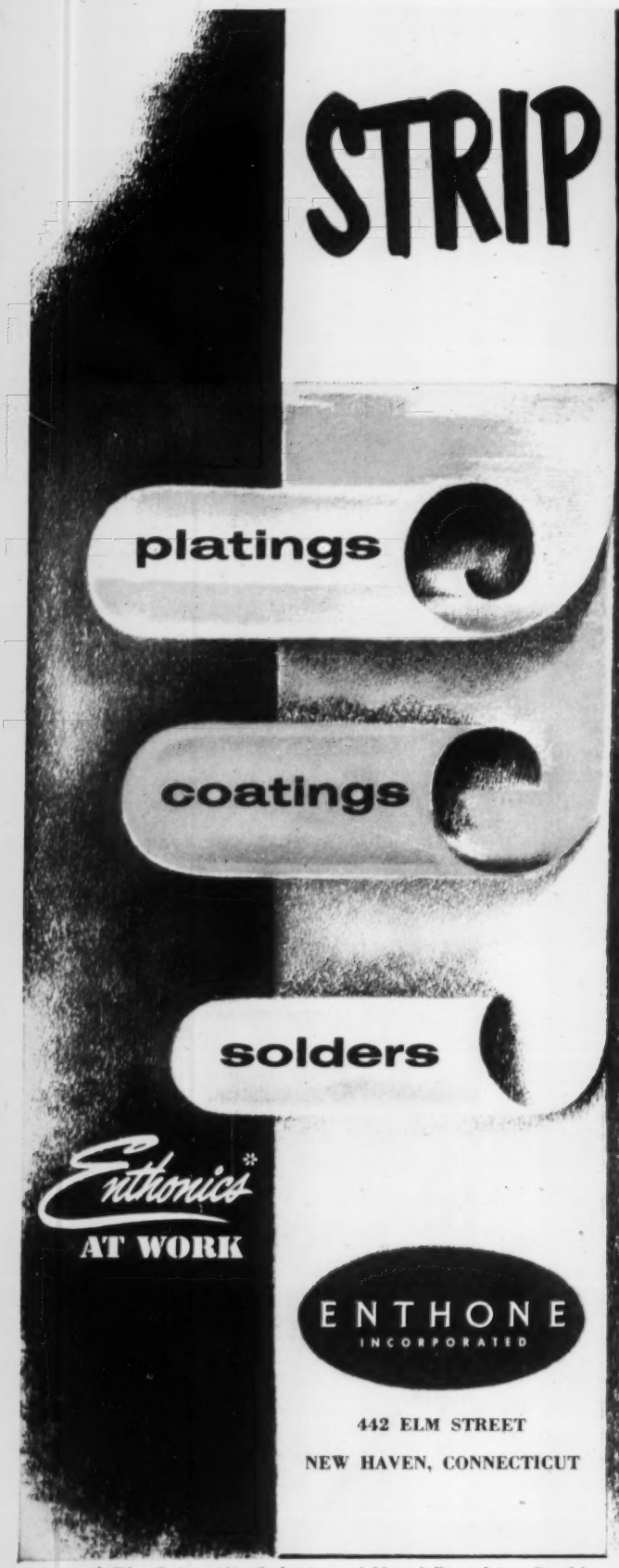
Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope and Wire Rope Assemblies. Mill depots: New York • Pittsburgh • Chicago St. Paul • Fort Worth • Portland Seattle • San Francisco • Los Angeles Distributors throughout the U.S.A.



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metal strippers

ENTHONE has developed 8 outstanding metal strippers which, without attacking your base metal in any way, quickly and economically strip off defective plated coatings, excess solder, silver brazing metal, and metal smuts.

Where your base metal is . . .	and you want to strip nickel, copper, silver, zinc or cadmium chemically, use **ENSTRIP "S"**, an additive for sodium cyanide solutions, or . . . **ENSTRIP "A"**, which is a prepared compound containing sodium cyanide.
STEEL	where you want to remove copper or nickel coatings electrolytically, use **ENSTRIP 103**, an economical alkaline electrolytic stripper containing no cyanide.
COPPER or STEEL	and you wish to dissolve tin, lead, or tin-lead coatings chemically, use **ENSTRIP "TL"**, a fast acting, alkaline stripper.
ALUMINUM, COPPER or STEEL	and you want to take off heavy chromium coatings chemically, use **ENSTRIP "CR-5"**, a rapid, acid type stripper.
COPPER ALLOYS	use **ENSTRIP "165-S"**, an additive for acid solutions that will give you quick removal of nickel, tin, zinc, lead or cadmium.
ZINC DIE CASTINGS	use **ENSTRIP "L-88"**, an acid electrolytic stripper for removing chromium, nickel or copper coatings.

. . . And where you want to strip off zinc or chromate coatings from **steel plating racks or defective work,** use **ENSTRIP "Z"**, an alkaline chemical stripper for fast chemical action.

All ENTHONE's metal finishing processes and products, as well as ENTHONE's wide experience in metal stripping, are at the disposal of your company. We welcome the opportunity to be of service to you. Write for literature, without obligation, to —

442 Elm Street, New Haven, Connecticut.

** The Scientific Solution of Metal Finishing Problems*

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 134 No. 12 March 22, 1954

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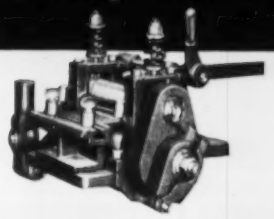
AUTOMATION
on your present punch press is easily obtained



with the
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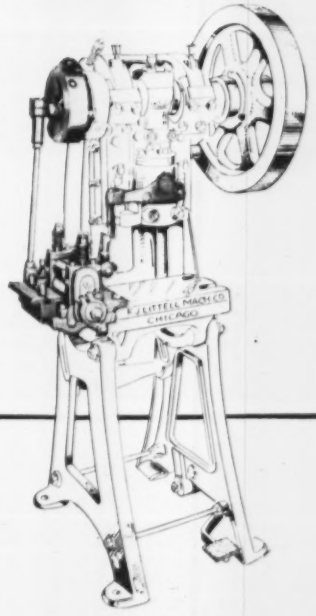
Style "M"
ROLL FEED



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BOLTS·NUTS
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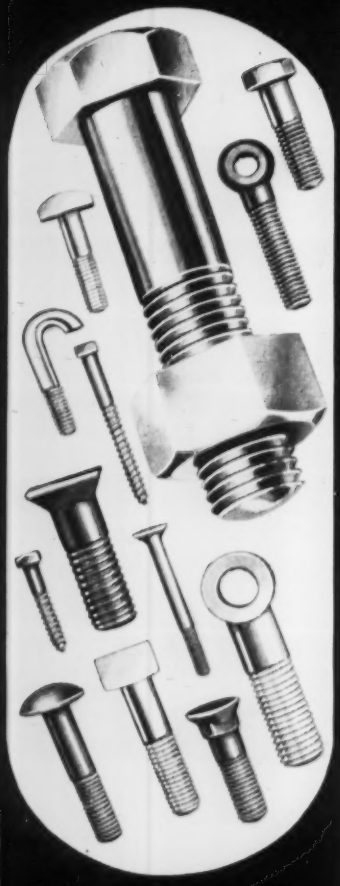

You can depend on a uniform Class 3 fit when you buy Pawtucket threaded fasteners. Standard items or specialties — all Pawtucket products are accurately made in standard dimensions or to your specifications. Heat treating with precision-controlled modern equipment.

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THE PLACE TO SOLVE YOUR BOLT PROBLEMS

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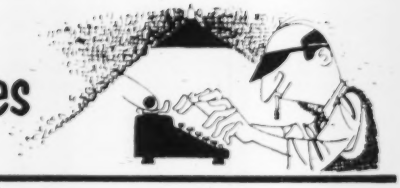
behind the scenes



Decision . . . Decisions!

All businesses come face to face with critical decisions. Fact is, the Boss is constantly reminding us here at the paper mill that each and every employee who is being paid more than $200 per month is being paid to solve problems . . . to make the correct decision most of the time.

Back in January, 1951, STEEL faced this major decision: whether to forego the many thousands of dollars in advertising income derived each year from running an advertisement on the front cover and replace the cover ad with interesting, informative front covers.

The consensus, obviously, was to by-pass the advertising income in favor of building more reader value, more reader interest and more reader pleasure into STEEL by dressing it in an attractive front cover package.

We were sure that we were making the right move then. Today we're doubly certain. You folks have convinced us with comments like these: "STEEL's cover ties in beautifully with its editorial content. It invites my readership." . . . "I believe an advertisement on the cover tends to cheapen the publication. I like STEEL's non-commercial cover." . . . "STEEL has eye appeal . . . makes me want to read it."

Calling Sen. McCarthy

When Ambrose, the ambidextrous office boy, left-handed this missile into our incoming basket we didn't pay it no mind. Later, when we came across it in a pile of morning mail, we did a Buster Keaton double-take and there it was, sure enough.

"Her Bright Green Hair Crimps Work at Plant" read the headline. The press release went on to explain that Mrs. Lucille Ballinger of Fullerton, California, had come to work at the Douglas Aircraft Co. in Long Beach wearing hair so green that it outbrillianced her fire-red blouse. Needless to say, Mrs. Ballinger, crib tool operator par excellence, stopped production in the plant.

After two to three hundred employees had queued up at her private side show, she rang down the curtain in the form of a bandana. She underestimated the power of advertising, however. Wasn't long until her grassy-green locks were restroom recitation throughout the multi-building plant and P. T. Barnum was getting ready to stage a comeback.

Company management took charge at this critical moment. Mrs. B. was requested to take the rest of the day off and please come back tomorrow as beautifully brown-haired as she could make herself.

And all the while McCarthy is afraid of the Reds!

What'll the Swiss Do Now?

We understand that the Bell System has developed the most accurate time-keeper in existence. This precision clock will vary about one second every thirty years . . . one-half minute every 900 years.

This master timepiece, among other uses, will monitor instruments in radio, TV and telephone networks. Will also do much to keep the wheels of metalworking America turning on time.

We'd certainly love to be V.P. in charge of resetting this baby.

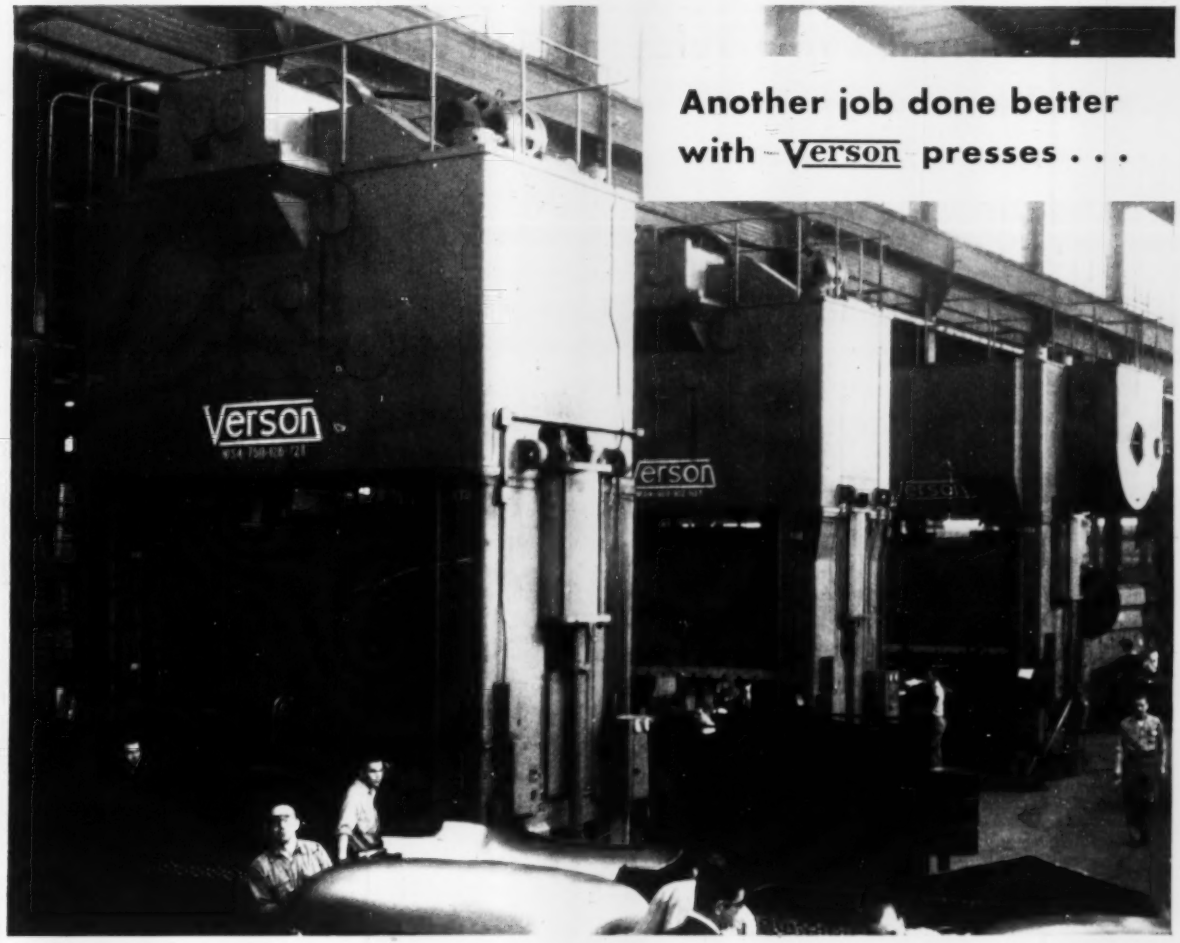
Quoting Al Gray

Caught Al Gray, STEEL technical editor, in a cozy sort of mood last p.m. and, in the course of our discourse, he tipped his hand on a new series of heat treating articles being worked up for your pleasure.

Look for our March 29 issue. The kick-off article will be "Modern Heat Treatment—Effect of Economics of Material Selection and Processing." While this will serve as a general announcement of the scope of the articles to follow, it will also highlight cost cutting possibilities of modern heat treating in material selection (leaner alloys) and metal processing (fewer steps).

Shrdlu

(Metalworking Outlook—Page 31)



This Verson line-up turns out truck cab tops for Morrison Steel Products, Inc.

Typical of the countless routine jobs that are being done better every day with Verson Presses are the truck cab tops manufactured by Morrison Steel Products, Inc. Buffalo, New York. In the line-up shown above are two Verson four point full eccentrics rated at 750 tons and 400 tons and a Verson two point full eccentric of 750 tons capacity.

Nothing outstanding about this installation? No, except that like so many manufacturers doing routine jobs, Morrison Steel Products has taken advantage of Verson's high standards of performance and economy. For the manufacturer this means better stampings at lower overall cost. This is proved by experience on all kinds of jobs over a period of a third of a century.

Whatever your press needs, whether the job is routine or one-of-a-kind, it will pay you to put Verson's experience and know-how to work for you. Catalog G-52 summarizes the complete Verson line and gives typical specifications. Write for your copy, today. There is no obligation on your part.

A Verson Press for every job from 60 tons up.

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ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

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MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES

Johns-Manville announces the development of new **SIL-O-CEL 16L** *Insulating Fire Brick...*

Lompoc, California, where Johns-Manville mines and processes diatomaceous silica insulating materials

Combines outstanding physical and thermal properties for furnace service to 1600F

Check these properties of SIL-O-CEL 16L

Maximum service temperature	1600F, back-up or exposed
Approximate density	33-35 lb per cu ft
Transverse strength	60 psi
Cold crushing strength	350 psi
Linear shrinkage	0.7 percent at 1600F
Reversible thermal expansion	less than 0.1 percent at 1600F
Thermal conductivity (Btu in. per sq ft per F per hr at indicated mean temperatures)	0.92 at 500F 1.07 at 1000F 1.22 at 1500F

1—has less than 0.1% reversible thermal expansion at 1600F

2—provides high load-bearing strength

3—for direct exposure or back-up service

Here is a new development of Johns-Manville insulation and refractory research. Its exceptional characteristics provide important savings in furnace construction. Made of diatomaceous silica, Sil-O-Cel* 16L Insulating Brick is light in weight . . . has low thermal conductivity . . . high structural strength. And where furnace linings are subjected to severe heat shock or where high load-bearing properties are needed, Sil-O-Cel 16L offers outstanding performance.

Sil-O-Cel 16L is now available. Samples will be sent on request. Also available without obligation is Booklet IN-115A, which describes Sil-O-Cel 16L and other J-M Insulating Brick and Insulating Fire Brick for service to 3000F. Write Johns-Manville, Box 60, New York 16, N.Y. In Canada, 199 Bay Street, Toronto 1, Ontario.

*Sil-O-Cel is a Johns-Manville registered trade mark

Replaces SIL-O-CEL Natural Brick

The development of Sil-O-Cel 16L Insulating Brick has resulted in the discontinuance of Sil-O-Cel Natural Brick. The outstanding properties of Sil-O-Cel 16L make it the ideal replacement for Sil-O-Cel Natural Brick for back-up use. In addition, the properties of Sil-O-Cel 16L Brick extend its use to exposed service applications.

JM

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"Save money? Sure!"

THAT, in a nutshell, tells you why so many wire rope users in the industrial fields prefer Roebling wire rope... it speeds up operations... lasts longer on the job... saves money that really adds up.

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Like an evil eye, fire is constantly on the lookout for unprotected hazards such as flammable liquids, electrical equipment, materials in process. Get protection that never sleeps. Guard every hazard in your plant with a Kidde Automatic Fire Extinguishing System.

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LETTERS
TO THE EDITORS

Selling Takes Top Priority

If it is possible, we would like to obtain 75 copies of your article "Now You Have To Sell" (Feb. 22, p. 91) No. 1 in STEEL's Program for Management series for 1954.

Samuel Weiss
president
American Coke & Coal Chemicals Institute
Washington

We read with interest your "Self-Quiz for Salesmen" which appeared in the article "Now You Have To Sell." We would like very much to reprint this list of questions for internal distribution and would appreciate your permission to do so.

A. V. Scherer
advertising manager
Air Reduction Sales Co.
New York

• *You have our permission.—ED.*

May we have a set of tear sheets . . .

Lewis B. Ebbs Jr.
Atomic Instrument Co.
Cambridge, Mass.

If reprints are available of STEEL's Program for Management series for 1953, I would appreciate it very much if you would send me a copy.

I believe this series of articles was an important contribution to good management in the steel industry.

J. E. Borendame
manager of sales promotion
Acme Steel Co.
Chicago

• *Sent.—ED.*

Prime Contractor on Press

On p. 75 of the Mar. 8 issue of STEEL appears a picture of the main cylinder for a 12,000-ton extrusion press.

As a part of the Air Force heavy press program, we have the prime contract with the Air Force for this press and we have subcontracted to United Engineering & Foundry Co. for the fabrication of the press.

We are at a loss to understand why this information was not incorporated in the picture caption for the photograph mentioned above.

Daniel L. Lombard
Lombard Corp.
Youngstown

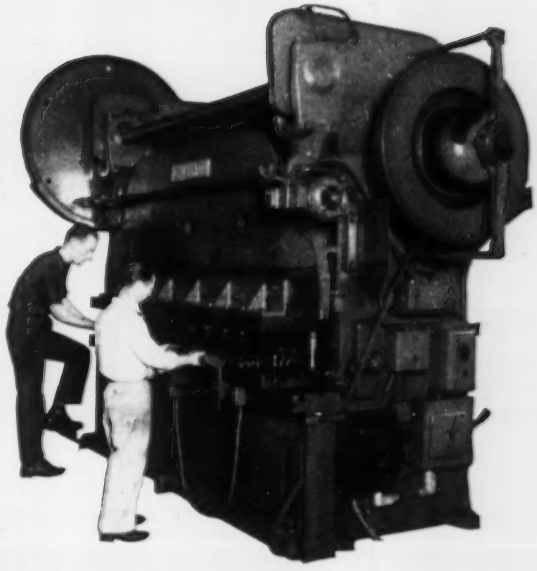
• *Photo caption, supplied by the company machining the cylinder, made no mention of prime contractor. We are glad to note Lombard Corp. is the prime contractor for this press.—ED.*

Please turn to p. 12

Photos courtesy Kirk & Blum, Cincinnati, Ohio

72 HOLES

where they belong



Economical assembly depended on maintaining the accurate spacing of these 72 holes and their accurate positioning on this 10-gauge sheet.

This Cincinnati Press Brake is giving a high production at low cost by its speed and accuracy of performance, which insures rapid low cost assembly.

As a press, they offer high production with low investment. As a Press Brake, their low set-up costs, quick change-overs and versatility bring profits.

Write for Catalog B-4 where many examples of the versatility of Cincinnati Press Brakes are illustrated.

CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

FOR SPECIAL REAMERS . . . REMEMBER

GORHAM

They may not *look* alike, but all of the special tools on this page share a common function . . . *because every one is a reamer!* Each was engineered and manufactured by Gorham Tool Company to provide a practical solution to a specific production machining problem for one of our customers.

Actually, these reamers represent just a few of the many special-purpose cutting tools produced by Gorham. Others include milling cutters and end mills, inserted blade cutters, flat and circular form tools, profile cutters, and carbide tipped tools of every description. Gorham "specials" are turning problems into profits in thousands of plants every day . . . and the one we engineer for you will solve *your* next production machining problem, too! Take advantage of our experience.

Your nearby Gorham Field Engineer is a qualified cutting tool expert in both practical design and actual application, and his assistance is yours without obligation. Just write for his name, or send details of your problem direct to us. We'll have him get in touch with you promptly.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

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WEST COAST WAREHOUSE: 576 North Prairie Ave., Hawthorne, Calif.

LETTERS

Concluded from p. 10

Dateline: Washington

WOULD LIKE NAME OF WRITER "PATENT POLICY GETS A FACE LIFTING" (Feb. 22, p. 57). ONE OF OUR CLIENTS WOULD LIKE TO CONTACT HIM. CLIENT PLEASED WITH ARTICLE AS HE IS GREATLY CONCERNED ABOUT PATENT POLICY.

F. L. Olsen
Hixson & Jorgensen Inc.
Los Angeles

• *Writer of that article was E. C. Kreutzberg, STEEL's Washington editor.—ED.*

Noise Problem Many Sided

I noted your article "It's Time To Give Noise a Hearing" in which you mention special mastic deadeners can be sprayed on machinery or housings; asphalt-indented felts can be used to dampen a vibrating surface and an illustration in the article shows bar stock rests on automatic screw machines wound with an insulating material to cut down the noise level.

It would be appreciated if you could supply us with more detailed information regarding these items, especially the winding of the stock supports on the automatic screw machines, such as the material that was used and the method of attaching it to the stock tube.

R. T. Beach
equipment engineer
International Business Machines Corp.
Endicott, N. Y.

• *For the specific information you seek, contact W. F. Scholtz, supervisor of industrial hygiene, Allis-Chalmers Mfg. Co., Milwaukee; Dr. Howard Hardy, Physics Division, Armour Research Foundation, Illinois Institute of Technology, Chicago; and the Acoustical Materials Association, New York.—ED.*

Water Is Important

In your editorial "Water Problem Is Urgent" (Jan. 25, p. 43) you have a quote from Mr. L. A. Danse, General Motors Corp., "Water is our most important raw material."

We are publishing a booklet for our client, Aeromotor Co., manufacturer of windmills for pumping water and a complete line of electric water systems. We would like to quote Mr. Danse. Can you give us his proper title and address so that we may request his permission to use his quotation?

J. B. Rodgers
vice president
Fensholt Advertising Agency
Chicago

• *Mr. L. A. Danse, assistant director of community activities, General Motors Corp., General Motors Bldg., Detroit 2.—ED.*

1736 Link-Belt helical gear drives chosen for Texas' newest pipe mill

Special, extra-thick cast steel housings withstand heavy shock loads at Lone Star Steel

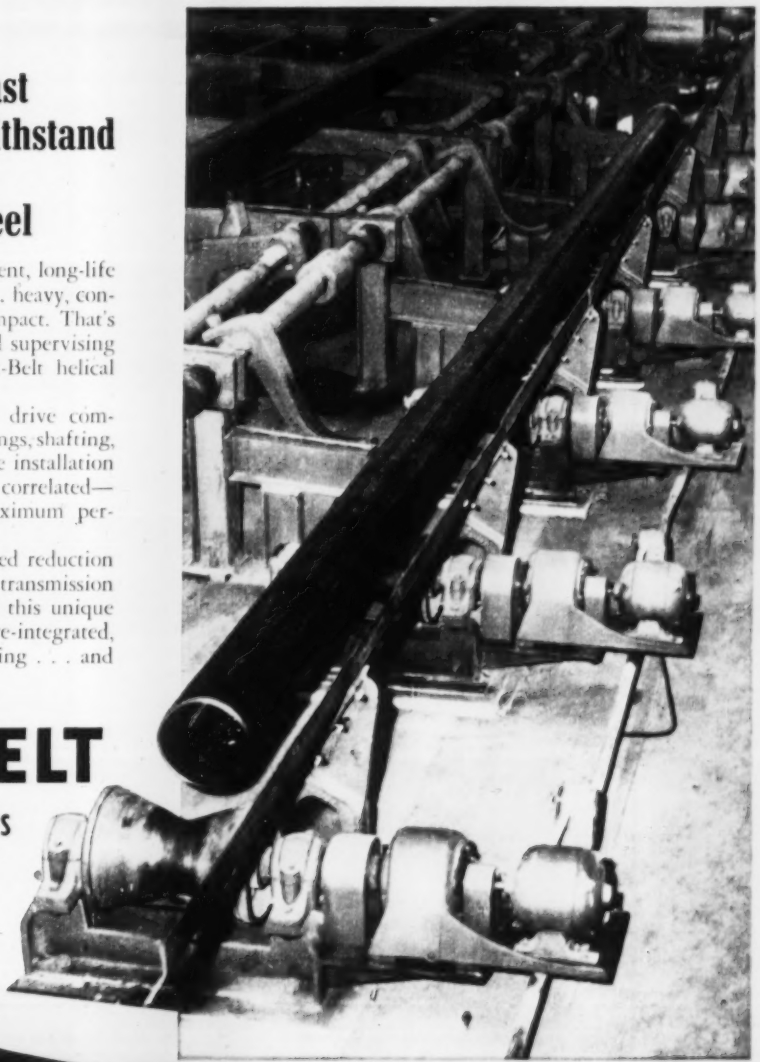
Only the finest drive can deliver efficient, long-life operation under high temperatures . . . heavy, continuous loads . . . frequent, severe impact. That's why A. J. Boynton Co., designing and supervising engineers, approved the use of Link-Belt helical gear drives at Lone Star Steel.

And, because Link-Belt builds all drive components—speed reduction units, couplings, shafting, bearings and baseplates—the complete installation is *pre-integrated*. All dimensions are correlated—assuring accurate alignment and maximum performance.

Next time you've a demanding speed reduction problem, call in a Link-Belt power transmission engineer. Nowhere else will you find this unique combination of a broad line of pre-integrated, quality products . . . expert engineering . . . and undivided responsibility.

LINK-BELT

ENCLOSED GEAR DRIVES



In this Lone Star Steel Pipe Mill, Link-Belt helical gear drives are used on the Enterprise roller conveyor units, the Selas normalizing furnaces and the Sutton rotary straighteners. In addition, Link-Belt supplied chains, roller bearing steel pillow blocks, geared flexible couplings, fluid, worm, herringbone and P.I.V. variable speed drives for this important installation.

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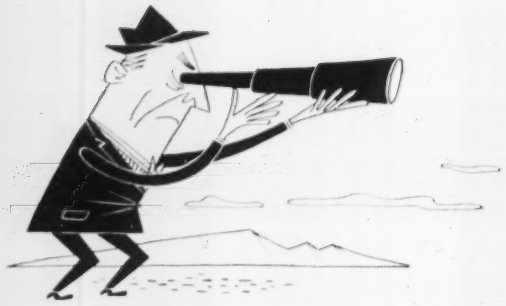

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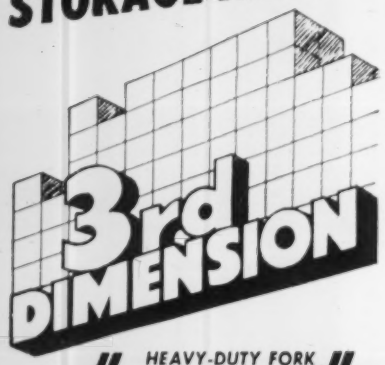

HEAVY-DUTY FORK
LIFTRUK

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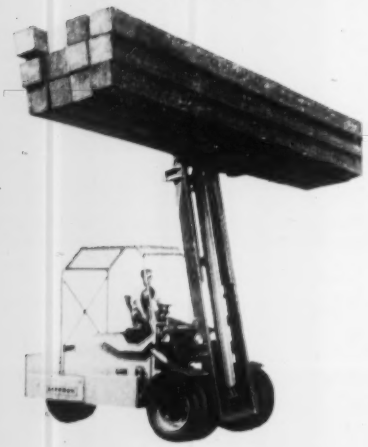
CAPACITIES



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Production Pointers from GISHOLT

GISHOLT TIME-SAVING IDEAS

Presented as a service to production men, we hope some of these interesting ideas, chosen from thousands of jobs, will suggest ways to help you cut time and costs in your own work.

TWO OPERATIONS ON ONE MACHINE...WITH ONE SETUP

Fastermatic Double-Chucks Part

This is a bit tricky, but note how these couplings are produced without tying up two machines or running up increased costs through needless changeover time.

The part requires two machining operations; two chuckings. The problem of how to do it on one machine using *one* tool setup was solved with a 2F Fastermatic Automatic Turret Lathe.

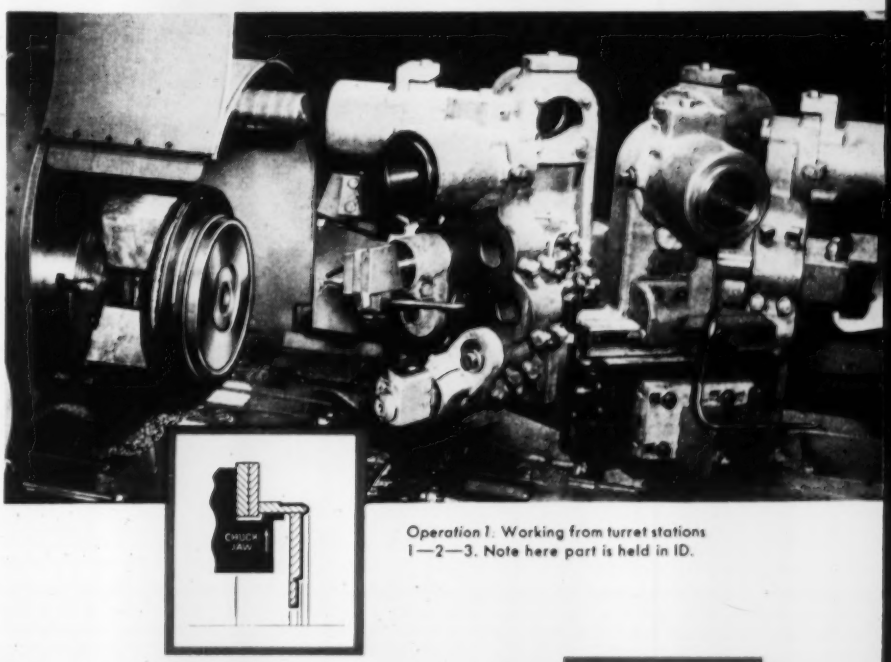
Here's how:

Operation 1—this consists of turning, facing, boring and chamfering from turret stations 1—2—3. The part is held in the ID with an air chuck. With this automatic cycle completed, the spindle stops and the workpiece is turned around and rechucked in the same jaws—except that now they hold on the OD.

Second Operation—the machine is started and automatically goes through the new machining cycle. Turret stations 4—5—6 rough and finish face on the other side, completing the part.

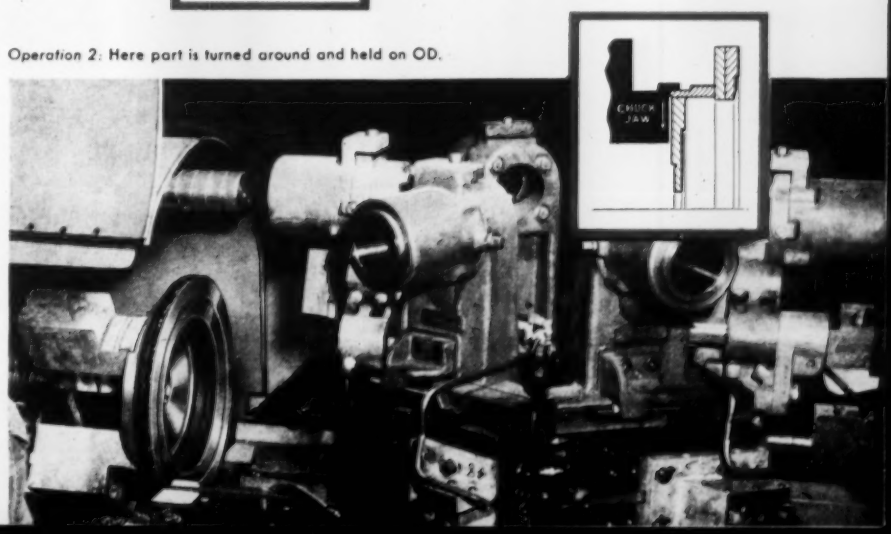
Obviously, this single-tooled, switch-around idea is not applicable in many cases. Yet, it is worth remembering. And so is the unusual versatility of the Fastermatic Automatic Turret Lathe which can account for reduced machining time and costs on many jobs.

The Fastermatic Automatic Turret Lathe does this unusual job easily and fast with both operations handled in one setup.



Operation 1. Working from turret stations 1—2—3. Note here part is held in ID.

Operation 2. Here part is turned around and held on OD.



TIME-SAVING IDEAS

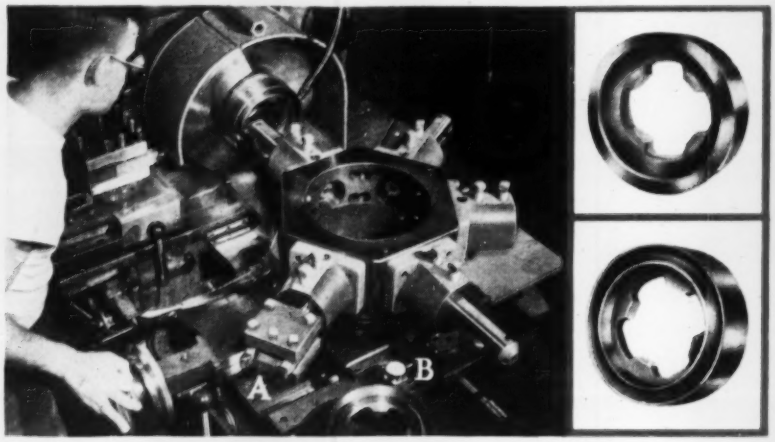
REDUCING TOOL COSTS ON DOUBLE-OPERATION WORK

C/F Turret Permits Simpler Tooling on Saddle Type Lathe

Here's a case where the producer wanted to handle first and second operations on one machine and do it with the simplest, most inexpensive possible tooling. The part is a 7½" commutator clamp. A Gisholt 1L Saddle Type Turret Lathe was given the job because there is considerable stock removal... and because it could be equipped with a cross-feeding hexagon turret to simplify tooling.

The drawing shows the surfaces machined in the two operations. Short flanged tool holders on the hexagon turret permit changeover in just minutes. The photo shows the setup for the second operation. Note the standard turret tool holder (A) which holds two cutters to finish the two faces of the outer rim. The cross-feeding turret handles both in one pass. This saves time and it insures dimensional accuracy.

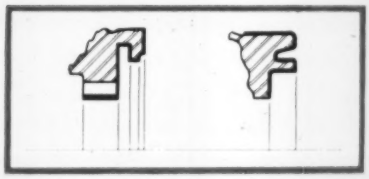
One bore has a particularly critical diameter. Setting the hexagon turret cross slide with the dial indicator (B) insures the precise dimension.



Machine view showing second operation.

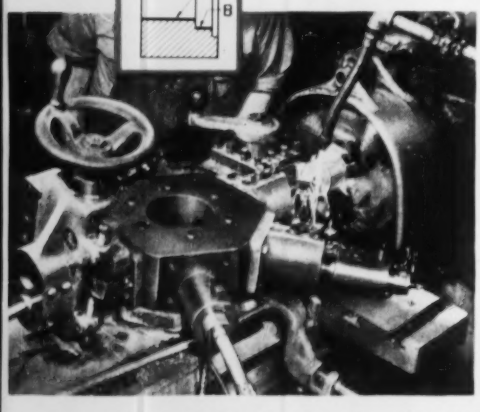
Finished piece, first and second operation.

Another example of how the cross-feeding turret on the Gisholt Saddle Type Turret Lathe can save time and reduce tooling costs on a variety of work.

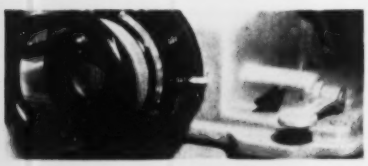


A SIMPLE JOB MADE EVEN SIMPLER

Quick Change of Spindle Speeds Saves Time, Effort, Money



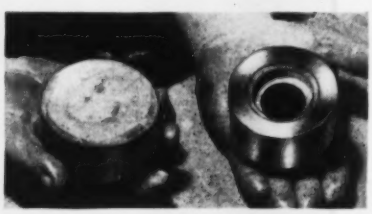
Working at 402 r.p.m., the operator will get reaming speed by merely tapping the HI-LO lever, shown below.



This would be a simple enough job in any shop. But here, the important differences in time and effort show up with the operation of the ram type machine. With the No. 5 Ram Type Turret Lathe, equipped with the Gisholt Hydraulic Speed Selector and HI-LO Trip Lever, time and effort are reduced to the barest minimum.

The reasons: (A) is first drilled and then bored from the hexagon turret. This work is done at 402 r.p.m. Then reaming is done. Here, with most machines, the operator would have to shift headstock gears to the new and lower spindle speed. With the Gisholt No. 5 Ram Type Turret Lathe, the operator just taps the HI-LO lever. Instantly the Hydraulic Speed Selector makes the shift. Even before the reamer is in working position, the spindle is turning at the correct speed—69 r.p.m. in this case.

Once the reaming is done, the operator again trips the HI-LO lever; and while the turret is indexing, the Hydraulic Speed Selector automatically makes the shift back to 402 r.p.m. Then counterbore (B) is started.



Rough workpiece and completed part.

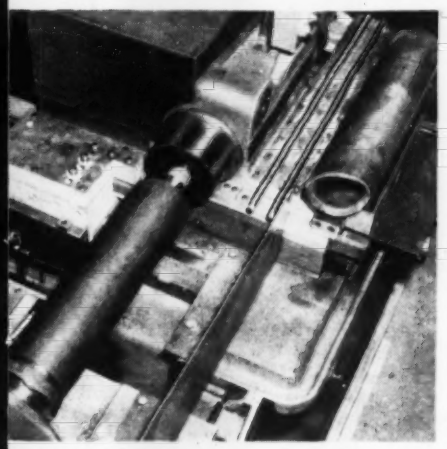
The Gisholt Hydraulic Speed Selector not only saves time and physical effort in changing speeds, but it also reduces floor-to-floor time. That's another good way to cut costs.

GISHOLT

TIME-SAVING IDEAS

SMART LOADING METHODS LIKE THIS WILL SAVE YOU TIME

Simplimatic Automatic Lathe Uses Slide to Aid Handling



With part completed, it is moved out on the rails and then onto the conveyor lines. New workpiece then is rolled onto the rails and pushed on arbor. Sketch below shows complete sequence.

This was not a matter of faster cutting, but faster "handling time." The workpiece is a 155 mm steel shell body. The machine is the Simplimatic Automatic Lathe. The job itself is simple: face down to the boss and cut off to length.

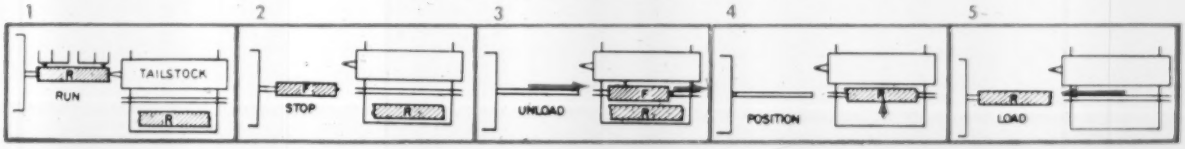
Most interesting is the expert work-handling method—a simple device that greatly increases machine use and hourly production by reducing loading and unloading time.

Step by step, the job goes like this: the slide with tailstock is retracted. Rails mounted on the slide guide the rough workpiece as it is loaded on the arbor. The slide then moves forward and the tailstock quill supports the work.

While the rear tools make chips, the operator places a new rough workpiece on the ramp at the front of the slide. With machining completed, the tailstock quill automatically retracts and the slide moves back. The finished part is moved off the arbor onto the rails and then to a conveyor line. Onto the rails goes the waiting rough workpiece and then on the arbor. The tailstock slide comes into position; the next piece is begun.

This job could easily take 20% to 40% longer without this efficient handling arrangement—even with the same machining time. Gisholt engineers have had extensive experience in solving loading problems. Let them help save time on your jobs of this kind.

The tailstock slide on this Simplimatic also carries loading-unloading rails which quickly position the work and ease the manual burden.



ALUMINUM IMPELLERS GET FAST MACHINING

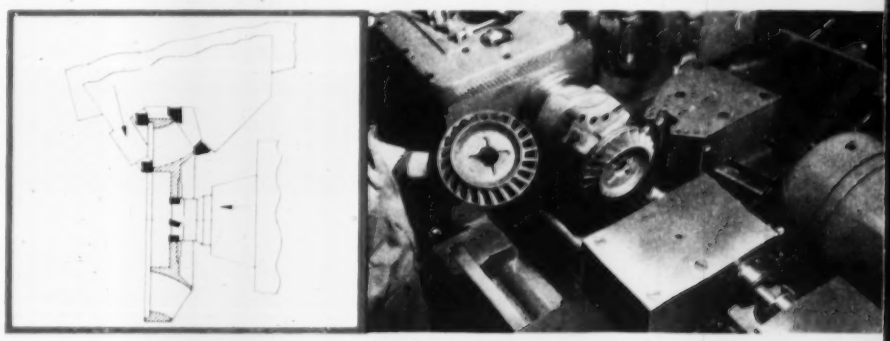
No. 12 Hydraulic Automatic Lathe does it in 10 Seconds

Split-second efficiency is a must on this job—machining operations on two different impellers for a popular car's automatic transmission. While the work is small, the volume is great. So, every second counts.

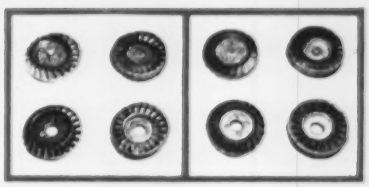
Only one No. 12 Hydraulic Automatic Lathe is needed to handle the entire output. With the workpiece located in the 3-jaw air chuck, the spindle is driven at 900 r.p.m. The workpiece center is then removed by trepanning under oil mist lubrication. A speeder drives the trepanning cutter by means of a sliding sleeve arrangement on the front carriage. Longitudinal carriage movement carries the cutter to and from the work, allowing clearance for loading.

The balance of the work is done with four tools in a single tool block on the rear slide. This slide moves in at an angle so that both back faces may be shaved at once.

Time is just ten seconds floor-to-floor. The No. 12 Hydraulic Automatic Lathe performs with speed and economy on all jobs working with all metals. It can give you the high production and low cost you want in your work.



The flexibility of the No. 12 Hydraulic Automatic Lathe permits the kind of tooling which reduces this job to only two simultaneous straight-line motions.



Top panels show both sides of rough parts, the completed parts are below.

Write for complete catalog of No. 12 Hydraulic Automatic Lathe.

GISHOLT

TIME-SAVING IDEAS

CYLINDRICAL PARTS BALANCED IN OVERHANGING POSITION

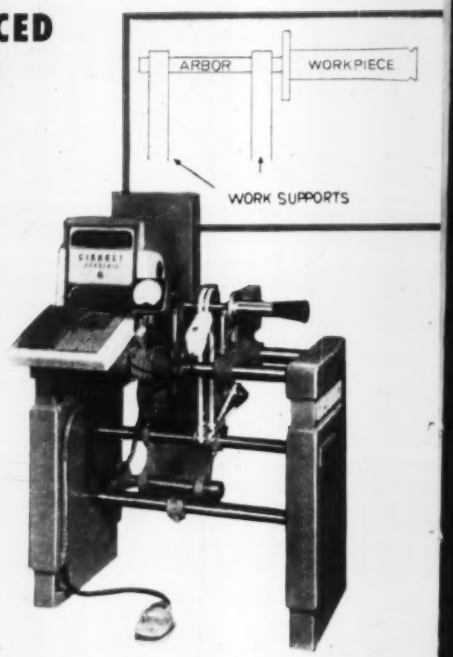
Improved 1S DYNETRIC Balancer Simplifies and Speeds up Two-Plane Balancing

The spinners used in textile mills must be dynamically balanced because of their high-speed rotation. Here, a rayon spinner, a workpiece typical of those which do not carry their own shaft, is being balanced on the Gisholt improved type 1S DYNETRIC Balancing Machine. The spinner is mounted on an arbor and balanced in an overhanging position. This simplifies loading and unloading since the arbor is not removed from the work supports. Simple left or right switches simultaneously indicate the location and amount of material to be removed in each correction plane. Correction is made after removal from the arbor. Production balancing of overhanging workpieces such as this is a simple operation on Gisholt Balancing Machines. Unbalance is quickly and accurately measured and located for correction.

The machine-mounted arbor permits balancing of overhanging parts and speeds up loading and unloading.

NEW CATALOG covers the improved and more complete line of Type S DYNETRIC Balancing Machines. It has full information and illustrates many interesting jobs. Write for your copy.

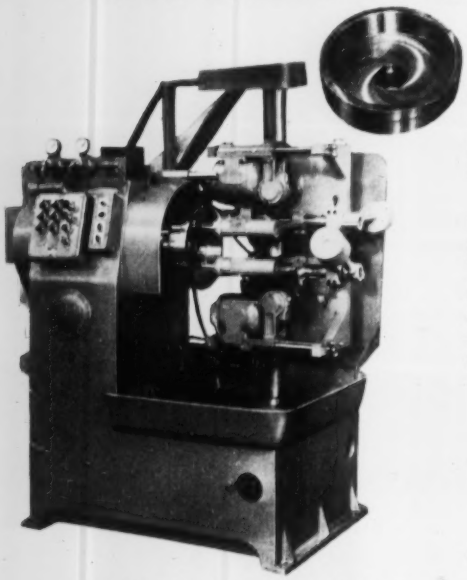
DYNETRIC BALANCERS



Improved Type 1S DYNETRIC Balancing Machine with loaded workpiece. Drawing shows permanently mounted arbor on work supports.

AIR CYLINDERS GREATLY IMPROVED BY SUPERFINISHING

ID Surface Handled in One Quick, Automatic Operation

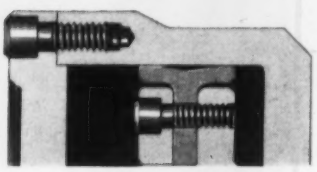


Model 79 Superfinisher showing stone holders in working position. Above, part ID is Superfinished; reflections are from true base metal.

This is one of our own applications of Superfinish. The part is the air cylinder used with Gisholt air-operated chucks.

To give maximum efficiency to these cylinders, we turned to the practical expedient of Superfinishing. The result is an ID surface that allows far less blow-by, and that greatly extends packing life. At first the parts were Superfinished in our Superfinishing laboratory. Then, to do the job on a production basis, a special automatic machine was designed, the Model 79 Superfinisher. It has large capacity with variable speeds and oscillation rates. For rapid loading and unloading, it is equipped with an air chuck.

In one fast, automatic operation all Gisholt air cylinders are Superfinished to make them better performing, longer serving.



Superfinish of the ID reduces blow-by and increases packing life.

SURFACE FINISH—its problems and how they are overcome by Superfinishing are fully covered in new catalog. Write for your copy now.

THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

No. 3-454

624

Write for your copy of Gisholt's new general catalog.

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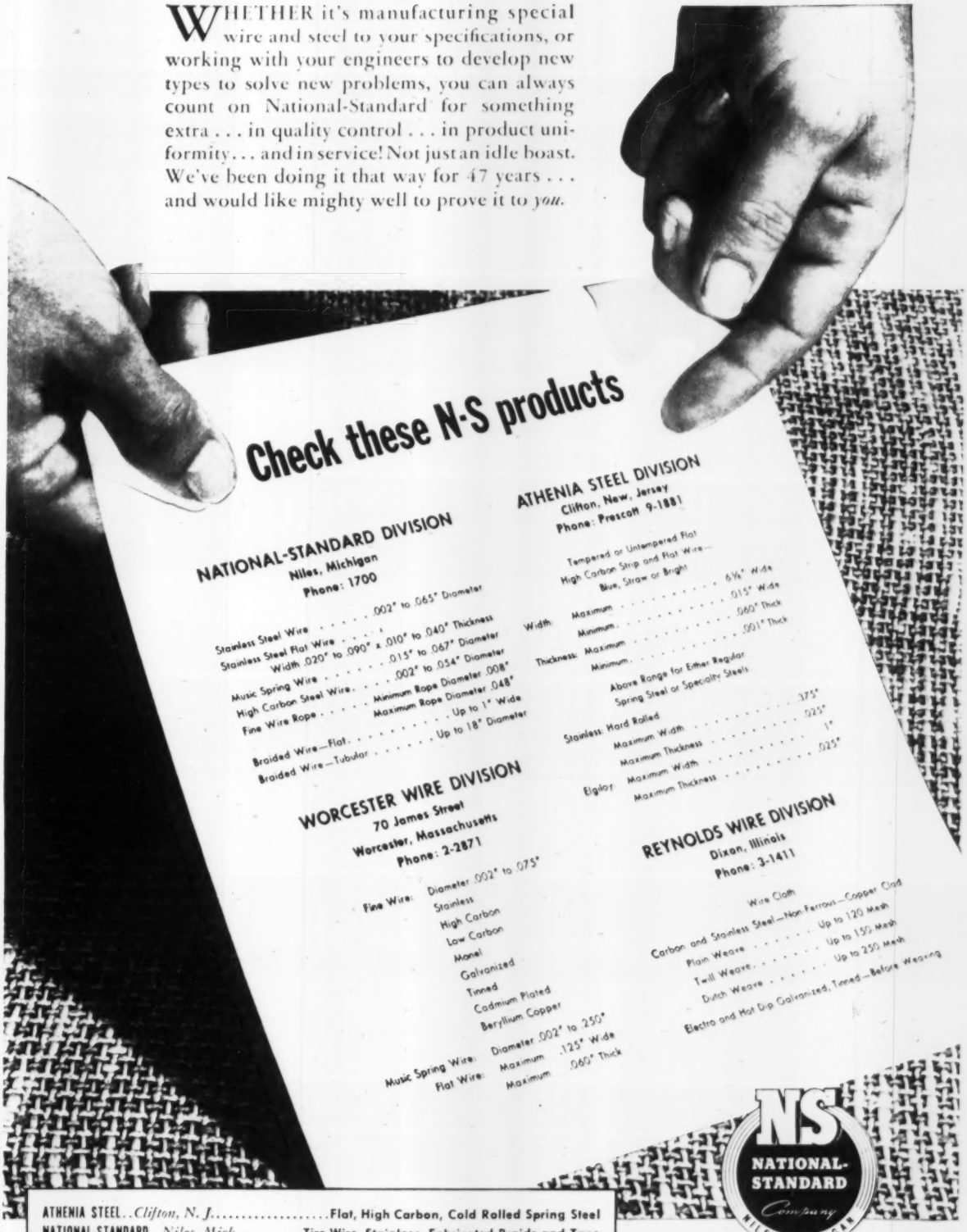
WHETHER it's manufacturing special wire and steel to your specifications, or working with your engineers to develop new types to solve new problems, you can always count on National-Standard for something extra . . . in quality control . . . in product uniformity . . . and in service! Not just an idle boast. We've been doing it that way for 47 years . . . and would like mighty well to prove it to *you*.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Width .020" to .090" x .010" to .040" Thickness
Music Spring Wire . . . . . .015" to .067" Diameter
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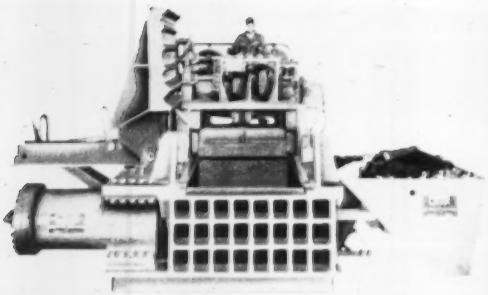
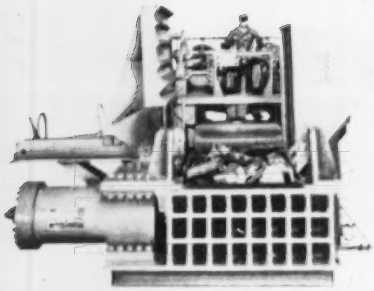
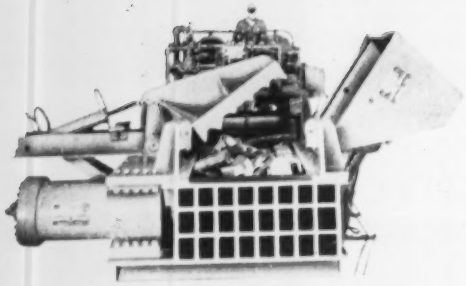


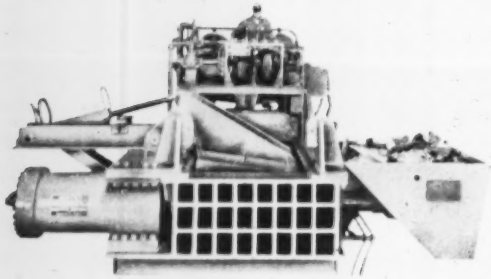
1. Here Skip Pan has been loaded.



2. Skip Pan dumps load into charging box.



3. Auxiliary-Compression Door starts its compression stroke as Skip Pan returns to be re-loaded.



4. Auxiliary-Compression Door crushes scrap into charging box.

5. At right the Auxiliary-Compression returns to up-right position and charging box door closes. Scrap is baled and then ejected. Skip Pan has been re-loaded and is ready to re-fill the charging box.

Dempster-Balester Auxiliary-Compression Door becoming a MUST for scrap metal baling

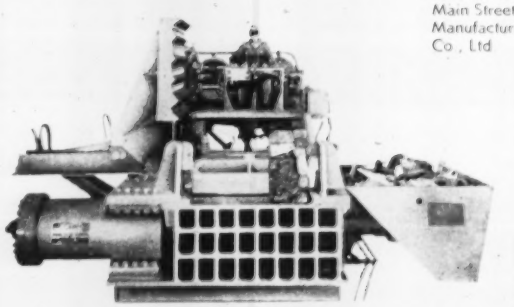
Before buying a scrap metal baling press, it is important to know that the Auxiliary-Compression Door is available exclusively for Dempster-Balesters. This door completely eliminates in some operations and materially reduces in others the costly process of tying up two or three extra men as arrangers. In addition, the hydraulically operated Auxiliary-Compression Door normally crushes scrap with one stroke . . . permitting charging box cover door to close immediately. This means a tremendous increase in production.

This increase in production and savings in man-hour costs have made the Auxiliary-Compression Door virtually indispensable for the greatest economy in scrap metal baling.

A Dempster-Balester Model 600 is shown in operation with Skip Pan Loader and Auxiliary-Compression Door. Note that every operation in the baling cycle is hydraulically controlled from the moment scrap is dumped into Skip Pan Loader until finished bale is ejected.

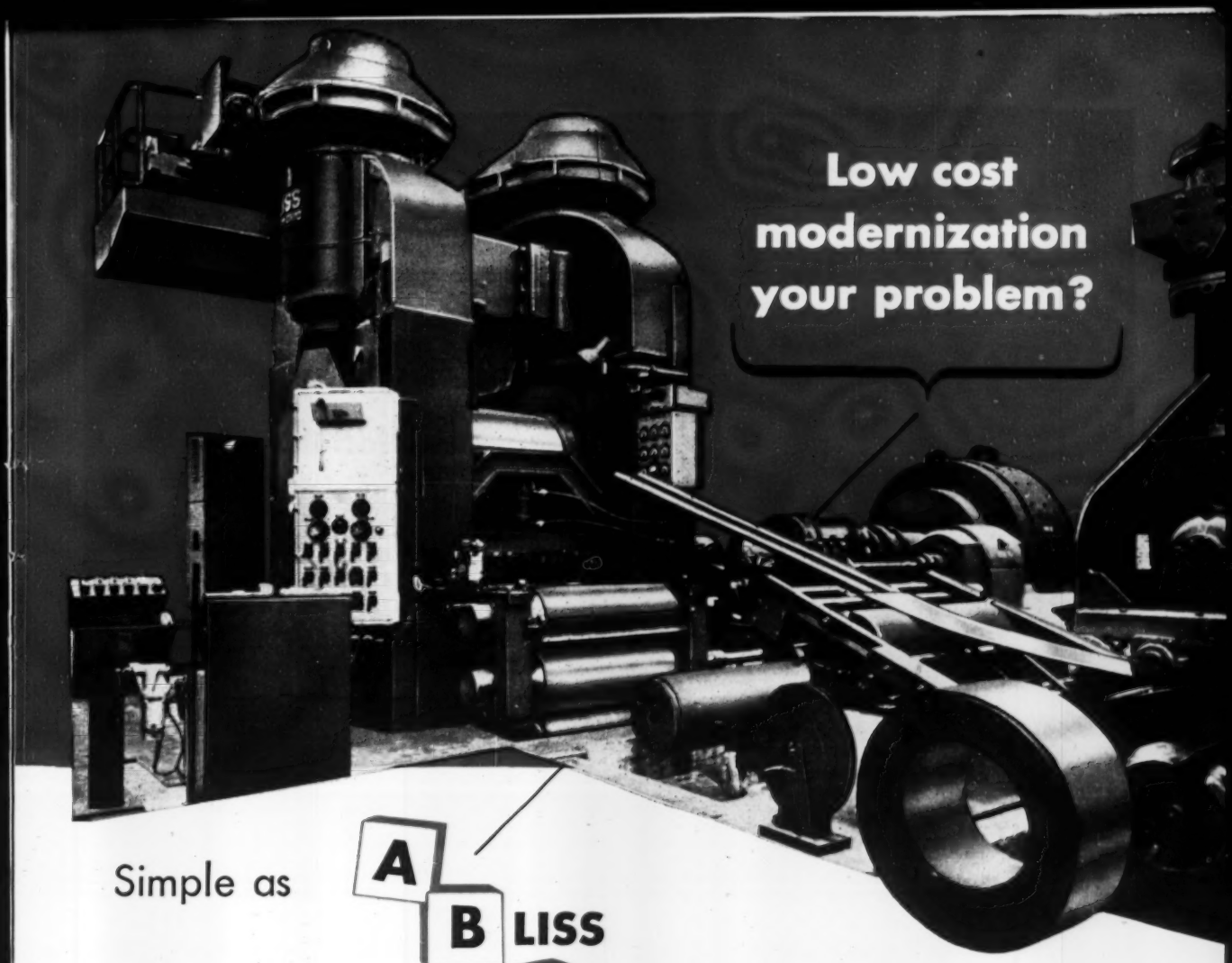
Write us for complete information. Dempster-Balesters are manufactured exclusively by Dempster Brothers, Inc.

IN CANADA: Sold by W. P. Favorite Co. of Canada, Ltd., 418 Main Street East, Hamilton, Ontario. Manufactured by Hamilton Bridge Co., Ltd.



DEMPSTER BALESTER

DEMPSTER BROTHERS, 834 Shea Bldg., Knoxville 17, Tenn.



Low cost modernization your problem?

Simple as A B LISS C ombination Mill

The problem of modernizing with limited funds was solved easily by executives of one prominent steel plant. They found that a *single* Bliss mill could replace *two* old special-purpose mills. By choosing a Bliss combination mill—designed for both cold reduction and temper pass work—they achieved advantages, not otherwise available, without a larger capital investment. These include:

- *Greater reductions, higher speeds, finer tolerances*
- *Conservation of valuable floor space*
- *Manpower savings with single operating crew*
- *Minimum idle mill time*

Bliss designed this versatile combination mill in order that changeover from cold reduction to temper rolling could be made quickly and easily. Special entry guides, tension bridle and other accessory equipment are supplied for this purpose, in the production of tin-plate as well as sheet stock.

If you, too, are interested in low cost mill modernization, consult Bliss. Meanwhile, write for your copy of the New 60-page Bliss Rolling Mill Brochure. Recently revised, it describes many modernization alternatives. Ask for Bulletin 40-A.

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CALENDAR
OF MEETINGS

March 23-25, Steel Shipping Container Institute Inc.: Annual meeting, Biltmore hotel, Palm Beach, Fla. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

March 24-26, American Power Conference: Annual meeting, Hotel Sherman, Chicago. Information: Edwin A. Whitehead, conference secretary, Illinois Institute of Technology, Technology Center, Chicago 16.

March 24-26, Rail Steel Bar Association: Annual meeting, Hotel Jung, New Orleans. Association address: 38 S. Dearborn St., Chicago. Secretary: W. H. Jacobs.

March 24-April 1, American Chemical Society: Spring meeting, Kansas City, Mo. Society address: 1155-16th St., NW, Washington 6. Executive secretary: Alden H. Emery.

March 25, National Industrial Conference Board Inc.: General session for all associates, Ambassador hotel, Los Angeles. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

March 25-27, American Hot Dip Galvanizers Association Inc.: Annual meeting, Hotel Netherland Plaza, Cincinnati. Association address: 1506 First National Bank Bldg., Pittsburgh 22. Secretary: Stuart J. Swensson.

March 29-31, Society of Automotive Engineers Inc.: National production meeting and forum, Drake hotel, Chicago. Society address: 29 W. 39th St., New York 18. Secretary and general manager: John A. C. Warner.

March 31-April 1, American Society of Mechanical Engineers: Management conference, Philadelphia. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

April 2-3, National Association of Cost Accountants: Ft. Worth regional conference, Hotel Texas, Ft. Worth, Tex. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnerson.

April 3-4, Packaging Machinery Manufacturers Institute: Spring meeting, Hotel Dennis, Atlantic City, N. J. Institute address: 342 Madison Ave., New York. Secretary: Helen L. Stratton.

April 5-6, Society of the Plastics Industry (Canada) Inc.: Annual conference, Mt. Royal hotel, Montreal, Canada. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

April 5-7, American Institute of Mining & Metallurgical Engineers: National open hearth conference, Palmer House, Chicago. Institute address: 29 W. 39th St., New York. Secretary: E. H. Robie.

April 5-7, American Society of Lubrication Engineers: Annual meeting and exhibit, Hotel Netherland Plaza, Cincinnati. Society address: 84 E. Randolph St., Chicago 1. Secretary: W. P. Youngclaus Jr.

April 5-7, Metal Treating Institute: Spring meeting, The Homestead, Hot Springs, Va. Institute address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

April 5-7, National Fluid Power Association: Spring meeting, Edgewater Gulf hotel, Edgewater Park, Miss. Association address: 1618 Orrington Ave., Evanston, Ill. Executive secretary: Barrett Rogers.

April 5-8, American Management Association: National packaging exposition and conference, Convention Hall and Auditorium, Atlantic City, N. J. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

April 6-7, Machine Tool Electrification Forum: Westinghouse Electric Corp., sponsor; Hotel Statler and Westinghouse works, Buffalo. Information: A. G. Muller, Westinghouse, East Pittsburgh plant.

April 7-9, International Acetylene Association: Spring meeting, Palmer House, Chicago. Association address: 30 E. 42nd St., New York 17. Secretary: H. F. Reinhard.

April 13, Material Handling Institute Inc.: Spring meeting, Drake hotel, Chicago. Institute address: 813 Clark Bldg., Pittsburgh 22. Secretary: N. F. Young.

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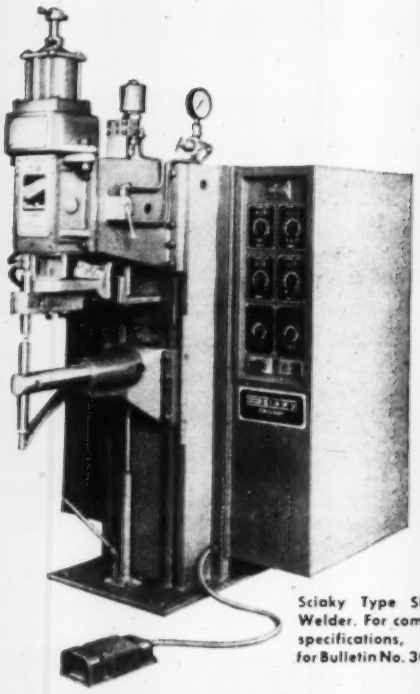

Sciaky Type SPT 2 Welder. For complete specifications, write for Bulletin No. 306-1.

Two Standard Sciaky Three-Phase Welders Join 42 Parts in 4 Operations

A short time ago Casco Products Corporation, Bridgeport, Conn., consulted Sciaky about special equipment for resistance welding simulated wire wheels for automobiles.

Power limitations at Casco were further complicated by design requirements . . . 40 spokes of .430 stainless steel joined to retainer rings . . . accurate fit on the automobile wheel demanded precise alignment of welded assembly...production rate of 1200 per day...strength to withstand vibration and shock of wheel rotation.

Avoiding the expense of special machines, Sciaky adapted two standard type SPT 2 welders with special tooling for multiple gun operation. Only four operations were required to join the 42 parts of the assembly.

Sciaky patented Three-Phase operation readily satisfied existing power facilities where conventional single phase could not. Sciaky Three-Phase, also, provided precise control to maintain tolerances of setdown and alignment.

The strength of the spot welded assembly exceeded requirements, and Sciaky Three-Phase produced a smooth fillet at weld eliminating need for special metal finishing. Production requirements were satisfied.

Write for the complete story of Casco's use of Sciaky welders for this job. Ask for "Resistance Welding at Work", Volume 3, No. 9.

Largest Manufacturers of Electric Resistance Welding Machines in the World

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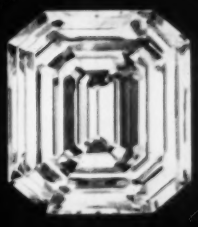
ROEBLING high carbon wire is unsurpassed for industry today. Roebling wire is absolutely true to specifications ...absolutely uniform in gauge and finish. Manufacturers who try Roebling wire once, become Roebling customers from then on.

You *pay* for the best when you buy high carbon wire. Make sure that you *get* it! Always specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.



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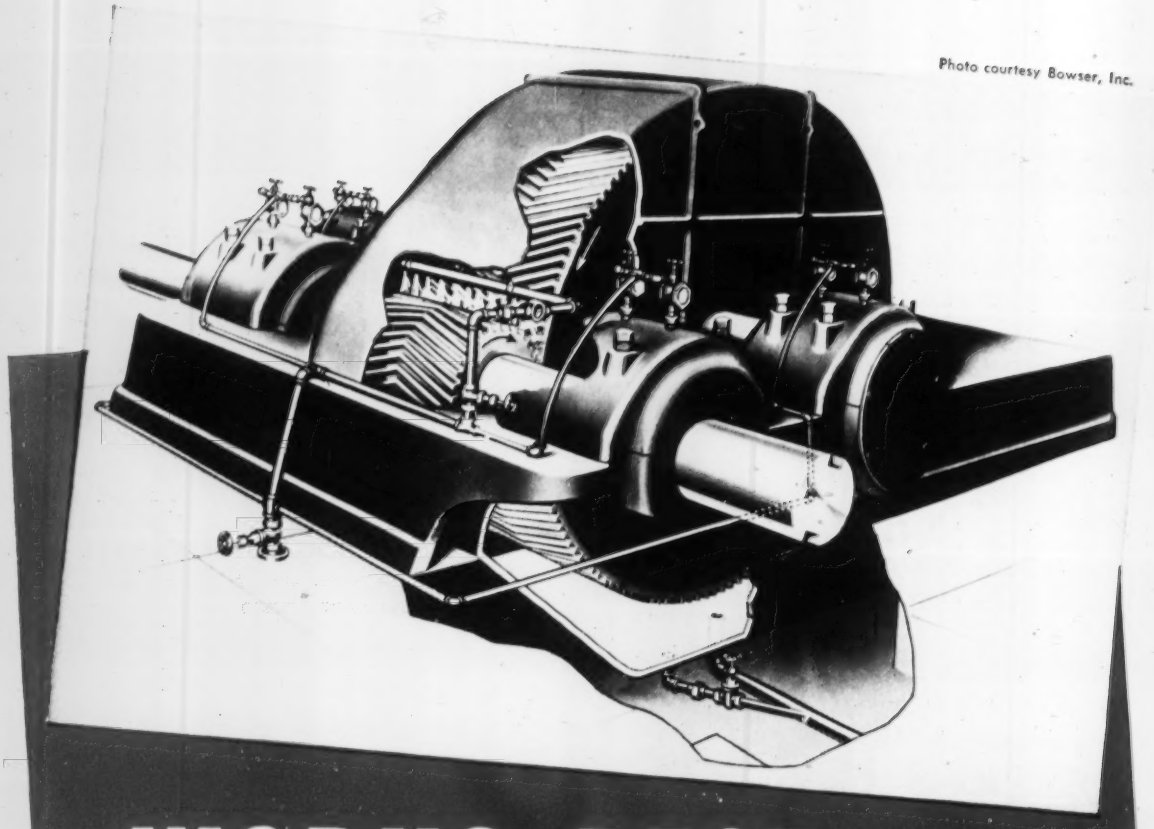

Photo courtesy Bowser, Inc.

WORKS BEST UNDER PRESSURE

THE lubricant for your enclosed reduction gears must be one that easily withstands extreme pressures. Use *Texaco Meropa Lubricant*. Its high and long-lasting EP properties make it tough, sturdy and wear-resistant — assure smooth, quiet operation — full protection even under the most severe service — lower maintenance costs.

Texaco Meropa Lubricants have extra resistance to oxidation and thickening. They will not foam, will not separate in service, storage or centrifuging. And you can depend on them to protect bearings from corrosion.

Lubricate oil film bearings on back-up rolls with *Texaco Regal Oil*. This heavy duty, turbine-quality oil effectively resists oxidation and sludging, saves you money because it keeps systems clean, bearings fully protected.

Let a Texaco Lubrication Engineer help you get greater efficiency and lower maintenance costs throughout your mill. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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FOR STEEL MILL GEAR DRIVES

TUNE IN . . . METROPOLITAN OPERA radio broadcasts every Saturday afternoon. See newspaper for time and station.

Metalworking Outlook

Taxes and the Economy

Business in the second half should improve over the first six months if only because of taxes. Two years ago industry had to pay only half its tax for the preceding year by June 15. Now it must pay 90 per cent by June 15 under provisions of the Mills law. Many companies, particularly the smaller and medium-sized ones, are holding off on purchases and liquidating inventory to make the payments. Steel warehousemen, industrial suppliers and others who deal with smaller customers report that this Mills law situation is causing difficulties. In 1955, 100 per cent of 1954 corporate taxes will be due by June 15.

Hot Start for a Cool Business

Air conditioning manufacturers are already off on a hot start to mark up another record sales year. An early heat wave in the Southwest is helping. Admiral Corp., as an example, expects to double its sales of room units in 1954. The industry as a whole this year should sell 15 to 25 per cent more than the 1 million units disposed of in 1953.

The Market in Toll Roads

Look for even greater construction of toll roads in the next five to seven years. Already in operation or under construction are 2000 miles of toll roads costing $2 billion. A Commerce department study shows that an additional 8000 miles are potentially suitable for development. Today about 30 states have enabling legislation for toll routes. If or when we get 10,000 miles, one-third of the rural mileage on the interstate system could be operated as toll facilities and be entirely self-liquidating. Significance: The self-financing angle will spur this type construction, bring a big metalworking market.

Proposals for Scrap

The Institute of Scrap Iron & Steel Inc. wants the government to stockpile ingots made from dealer scrap. The proposal is to forestall "a critical breakdown" within the scrap industry. Although STEEL's price composite for steelmaking scrap last week rose 16 cents to $24.33 per gross ton, it's still a long way from the $44.17 of a year ago. The institute is also exploring the feasibility of setting up a private corporation to provide financing for the scrap industry. In addition, it's pressing for removal of certain export licensing restrictions, seeking government loans and trying to obtain lower freight rates on scrap.

Messrs. Reuther, McDonald Agree

Two top labor leaders, Walter Reuther and David McDonald, say that the nation's economic condition is getting worse. Mr. Reuther says the auto industry in Detroit has 141,000 unemployed, and Mr. McDonald claims "a freezing up is developing." The prescription by both is more government

The Technical Outlook—p. 91 The Market Outlook—p. 127

medicine, especially more public works. The steelworkers' president adds that more "hustle" by businessmen is also needed.

Pressure for Pensions

Watch for more pressure by the CIO this year to win pension plans in small companies. Pushed will be area or pool schemes. The United Auto Workers has had two test plans in effect since 1950. One in Detroit covers 73 shops in the tool and die industry and permits transfer of pension credits among members of the pool. The second, in Toledo, covers 27 small companies in diversified industries. Just formed is a third plan. It covers six diversified small firms employing 600 in the Detroit area.

New Allegiance for 20,000

The shift by the 20,000 members of Local 301 employed by General Electric Co. in Schenectady from the independent to the CIO electrical union will lead to many more such transfers. The red-tinged United Electrical-workers union is not dead yet, but it's ailing.

Steel Pool Loan?

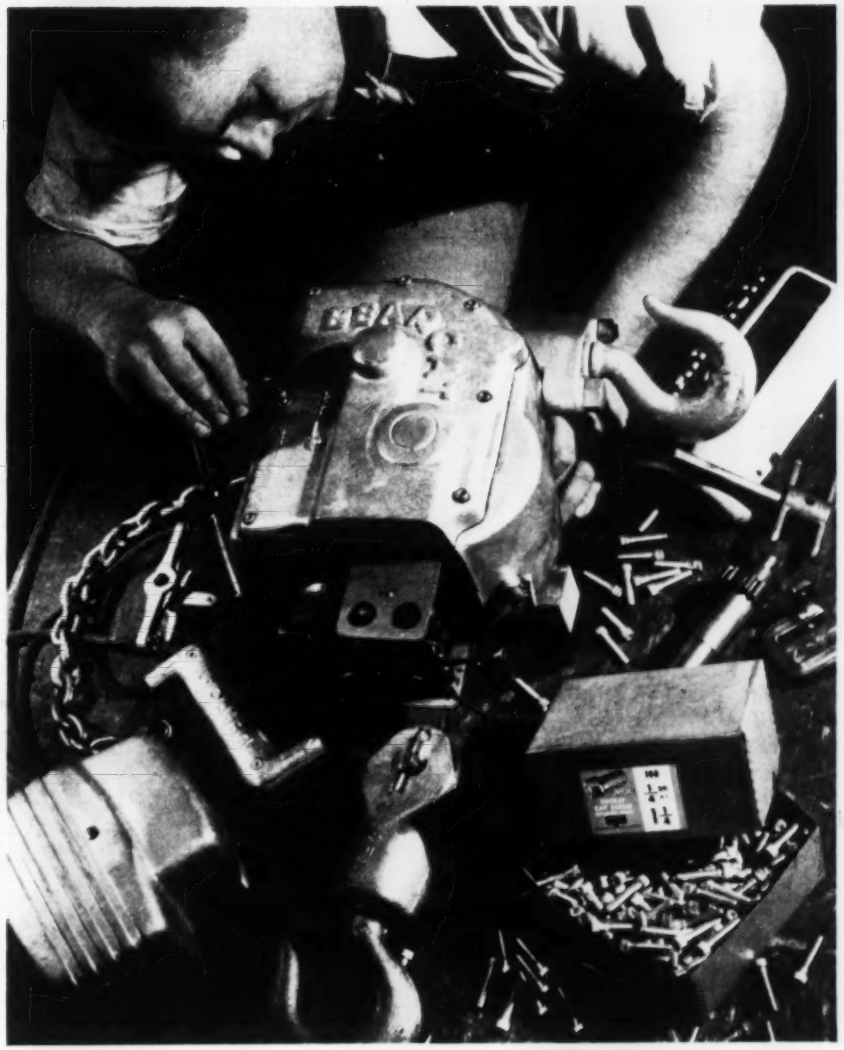
The U.S. may lend about $100 million to the European Coal & Steel Community. The proposal is to be discussed "within the next two or three weeks" in Washington conferences between Treasury officials and Jean Monnet, president, High Authority for the Coal & Steel Community. The idea is to increase the community's output and to attract more private investment capital. If granted, the loan would be the first by the U.S. to a European supranational organization.

Straws in the Wind

Structural steel business is looking up; an order for 21,500 tons to go into the new Socony-Vacuum office building in New York has been awarded through Turner Construction Co. to U.S. Steel Corp.'s American Bridge Division . . . National Lead Co. and Republic Steel Corp. will co-operate to build a large pilot plant near Birmingham in a project to upgrade southern iron ore and iron-bearing materials . . . A moving sidewalk soon will be in operation between the stations of the Erie Railroad and the Hudson & Manhattan Railroad in Jersey City, N. J. . . . Inland Steel Co. plans 1954 capital expenditures of $35 million.

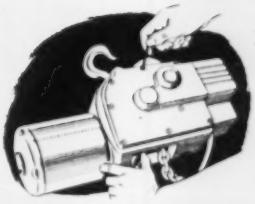
This Week in Metalworking

The competitive battle between trucks and railroads can mean lower rates and better service for you in 1954 (p. 39) . . . As its contribution to the fight against double taxation of corporate dividends, a U.S. Steel Corp. survey shows that 68 cents of each potential dividend dollar goes to the U.S. (p. 41) . . . More, bigger, better and remodeled houses give a four-way stretch to a metalworking market (p. 42) . . . New plant and equipment expenditures may hit $27.2 billion in 1954, off only 4 per cent from the record in 1953 (p. 44) . . . The capital expansion means continuing good business for electric motor control makers (p. 45) . . . For a case study on how Bellows Co. launched a completely new line, see p. 51 . . . Westinghouse Electric Corp. begins color television production (p. 52).



23 UNBRAKO Socket Head Cap Screws are used to assemble this lightweight, high efficiency electric hoist. They were selected for their uniform accuracy and high tensile strength.

The knurling on the head of UNBRAKO Socket Head Cap Screws permits faster assembly, because of the positive slip-proof grip.



The uniform depth and size of the hex socket assure strength and maximum torque in wrenching—extremely important in the cap screws used to fasten assemblies like this.

UNBRAKOS—made of heat treated alloy steel—have fully formed threads, Class 3 fit, controlled fillet and continuous grain flow for strength. In standard sizes from # 4 to 1".

Save time and money by using UNBRAKO Standards...stocked by your distributor

You'll have less money tied up in inventory, you'll need less space for storage, you'll get personalized service and faster deliveries. And you'll be buying the finest socket screw products that modern machines, complete facilities and quality control can produce. Write for UNBRAKO Standards, a complete listing of socket screw products made by the world's largest producer. STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

UNBRAKO® SOCKET SCREW DIVISION SPS JENKINTOWN PENNSYLVANIA

Would new shapes help keep your products ahead?

When your products go on the drawing board for redesign, it may pay you to keep in mind the many advantages of Armco Steel Tubing in special shapes. Tubing is pleasing to the eye. It may be the means of giving your products the extra sales appeal you want.

Chances are good we can supply this welded mechanical tubing in any shape you require. Getting tailored-to-order shapes can help you eliminate or greatly reduce many costly fabricating operations. They help step up production too.

Besides these shop savings, tubular parts give your products the most efficient section for light structural requirements under many types of loading conditions.

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Armco Tubing is supplied in hot-rolled steel, cold-rolled steel, and Armco ZINCGRIP (steel with a specially applied zinc coating). ALUMINIZED STEEL Tubing is made of a hot dip aluminum-coated steel that resists combinations of heat and corrosion.

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Healthy Tax Reform

People who ought to know say that the new tax bill is the most important tax legislation this nation has considered in at least four decades. In its text, which extends over more than 900 pages, are two dozen proposed major changes and hundreds of minor changes. They represent the painstaking work of experts who have been trying hard to introduce long overdue reforms into our tax structure.

It is a pity that this monumental job is exposed to the light of day at a most unfavorable moment. The Eisenhower administration, after struggling with the gigantic problem of reducing government expenditures, balancing the budget, curbing inflation and yet trying to give corporations and individuals some relief from their terrific tax burden, finds itself facing a vote-conscious Congress that is hell-bent upon demonstrating to the public that they—senators and representatives—are desirous of cutting taxes for individuals more sharply than the administration thinks is advisable.

It required courage on the part of President Eisenhower to face the people via television last Monday night and to tell them frankly why he does not favor the proposal of some Democrats to raise the individual tax exemption from $600 to $700 or $800 this year and $1000 next year. And the next night it was not courage but demagoguery that prompted Senator George and Congressmen Rayburn and Cooper to ridicule President Eisenhower's tax program as "relief for the rich."

These three manifested no concern for the plight of humble taxpayers during the administrations of Presidents Roosevelt and Truman from 1933 to 1952. At the beginning of that period a married man with two children with an income of $5000 was paying an income tax slightly under $75. At the end of 20 years of that party's rule, he was paying about $475. Not only that, but the purchasing power of his dollar had been cut almost in half.

One hopes that the final tax decision will lean more toward the Eisenhower proposal than toward the evident intent of Congress. Inflation has been stopped dead in its tracks. Let's not foolishly give it a fresh start.

E. L. Shaner

EDITOR-IN-CHIEF

MORE OWNERS NEEDED: An important fact to be remembered in the current feuding about higher exemptions for income taxpayers versus relief for the so-called double taxation on incomes is that a break for investors can be translated easily into an even

greater break for employees. This fact is manifest in a breakdown of U. S. Steel's annual report.

The corporation's approximately 300,000 stockholders have invested an average of about $8000 each to provide the tools of production for about 300,000 employees. The old "new deal" and "fair deal" doctrine was practically to ignore stockholders, because they are too few to be important at the polls. It is true that there are not as many stockholders as there should be. Nevertheless, ownership of stock in industrial enterprises is one of the most neglected opportunities in American life.

To increase shareholders from the present 6 million to 60 million would be a major boon to our economic system.

* * *

SMALL SHAREHOLDERS: We do not know whether or not United States Steel Corp. planned its questionnaire to its 300,000 shareholders with the idea of presenting pertinent information to the Eisenhower administration at a time when it was confronted with a rather embarrassing charge of class discrimination. We do know that the results of U. S. Steel's survey were used to good advantage by President Eisenhower at his press conference last Wednesday.

U. S. Steel's questionnaires went out to its individual stockholders, about half of whom replied. Of those who replied, only 10 per cent had incomes greater than $25,000. Only 26 per cent had incomes of more than $10,000 annually. Nearly three-fifths—56 per cent—had incomes less than $5000 a year. This last statistic is so impressive that the President quoted it in his press conference last week.

* * *

IMPROVING MANAGEMENT: No. 2 in this publication's "1954 Management Series" (pp. 81-88) deals with the important problem of developing better executive personnel. Today the job of managing industrial corporations is far different from what it was a half century ago when in many instances the boss of an enterprise was its owner. Recently the trend has been more and more toward wider distribution of ownership, with stockholders through a board of directors hiring professionals to run their business for them.

This trend focuses more attention upon the need for higher-grade executives. It can be said that in most cases a company is missing a good bet if it is not conducting a management development program to increase the competency of management, provide reserves for the future and ease succession problems.

* * *

BARRIERS TO EXPORTS: During the 35 years from 1918 to 1952 exports accounted for 20.2 per cent of the machine tool production of the United States. In 1953, foreign orders were only 7.6 per cent of the total. This is a new low point. Meanwhile, machine tool imports into the United States rose from $1.8-million in 1948 to almost $50 million in 1952.

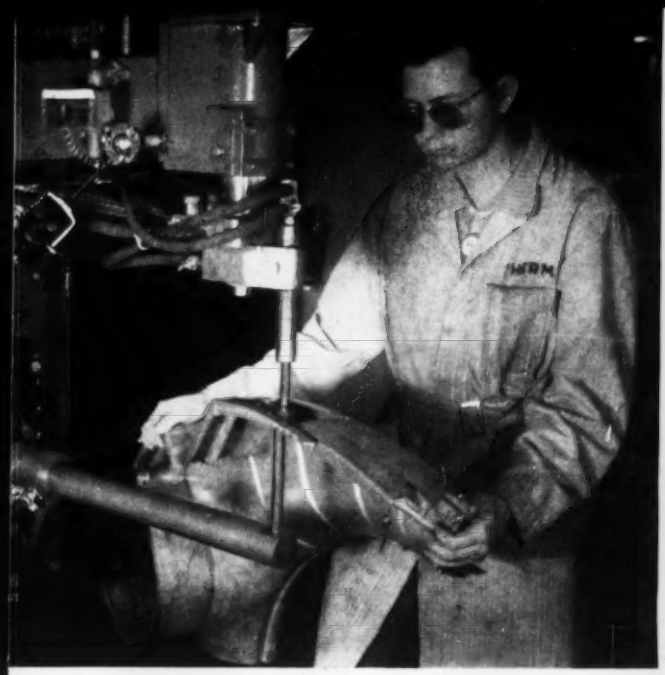
There are several reasons for this situation, but the National Machine Tool Builders' Association stresses the point (p. 49) that the problem is not one of the American tariff. On the contrary, it is one of removing nationalistic preferential restrictions and policies imposed by foreign governments on American products. Most Europeans must obtain an import license to purchase from a United States builder and constantly they are urged to buy a French, German, British or Italian machine if possible. When a European purchaser, as a last resort, does place an order in the United States, the American seller has to obtain an export license.

Much of this red tape is unnecessary.

* * *

IN BUSINESS 50 YEARS: In the first quarter, 1954, edition of *Steel Construction Digest*, published by the American Institute of Steel Construction, is a chart and tabulation showing the structural steel fabricators of the United States which have reported being in business for 50 years or more. The oldest is Morris, Wheeler & Co., which has been fabricating steel for 125 years. Next are four companies—Utica Steam Engine, Tower Iron Works, Hassey Mfg. Co. and Jos. T. Ryerson & Son—which have been in the business for more than 100 years.

Eleven companies have served customers for more than 75 years but less than 100 years, and 25 have been in business for periods ranging from 50 to 74 years. Thus there are 41 structural steel fabricating establishments that have continued in this highly competitive field for a half-century or more. Many will agree that this is a rather impressive record of stability and longevity.



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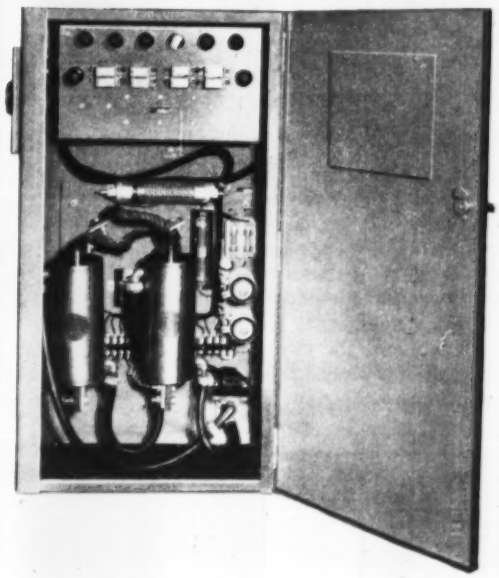

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☐ GEA-5816, "The Story of Resistance Welding", theory behind the process and complete description of all G.E.'s controls.
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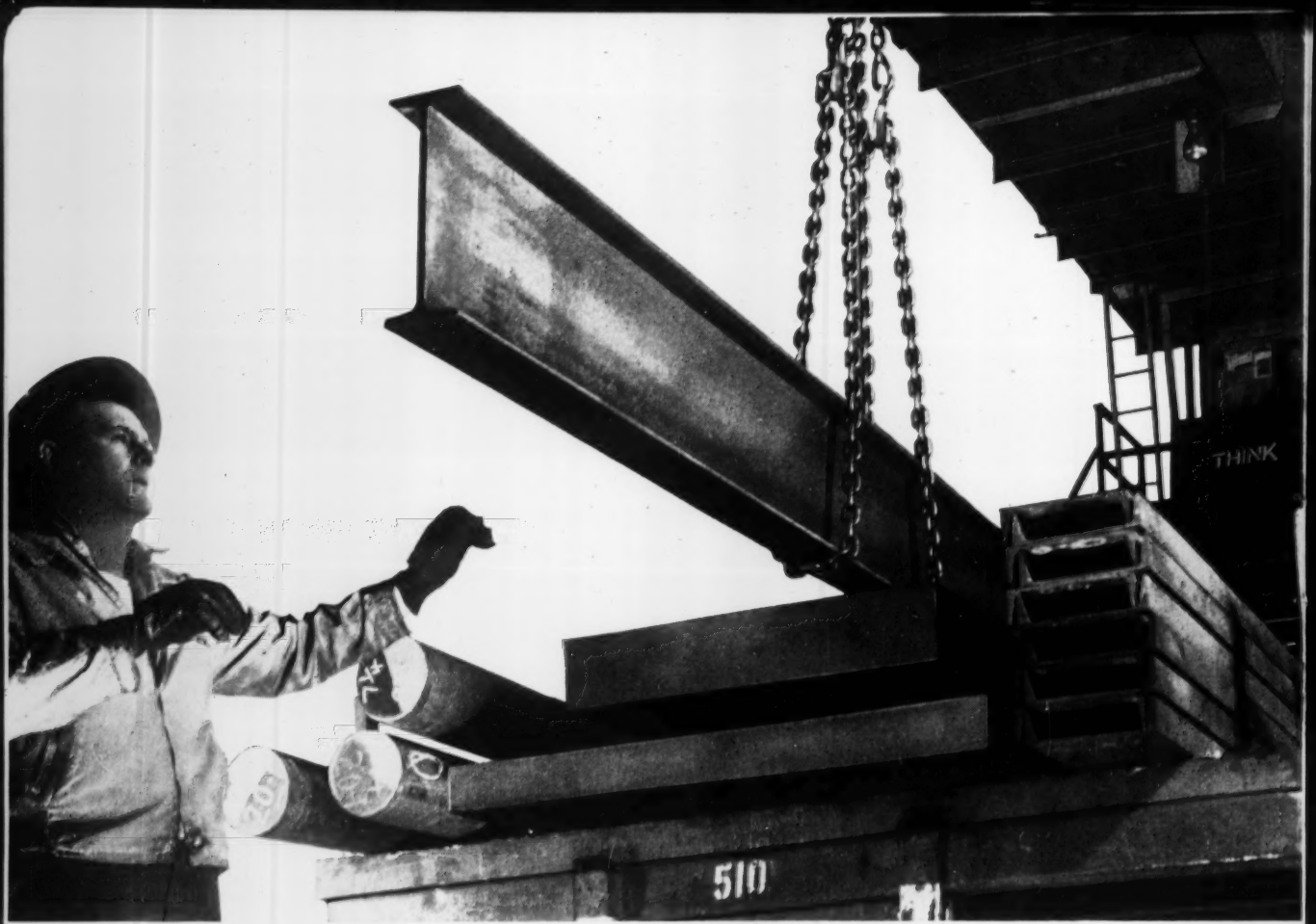
GENERAL ELECTRIC



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Railroads Fight for Steel

Even if proposed rate reduction fails, sharper competition in transportation means better, cheaper service for industry

YOU CAN get a better break in transportation this year.

The rail freight rate reductions pending before the Interstate Commerce Commission will mean cost savings if approved. That's not to be scoffed at since industry spends an estimated $17 billion annually on transportation. Beyond those rate reductions, moreover, both the railroads and truckers are looking to the service angle of their businesses.

Service Too—As one railroad executive told STEEL: "Reducing rates will amount to no more than throwing money away unless service is improved. Service in many cases is more important than rates." President of one trucking firm has said: "Motor carriers will

How New Rail Rates on Many Steel Products Could Cut Your Freight Costs

(Rates* in cents per 100 pounds)

	Rail mileage	Present Rail Rates 40,000 lbs	Present Rail Rates 80,000 lbs	Proposed Rail Rates 40,000 lbs	Proposed Rail Rates 80,000 lbs	Truck Rates (Usually 32,000 lbs)
Pittsburgh to Warren, O.	80	28.8	18.4	17	14	18
Gary to Elkhart, Ind.	105	36.8	21.9	22	17	19
E. Chicago to Kokomo, Ind.	140	39.1	25.3	25	20	20
Covington, Ky. to Toledo, O.	200	48.3	32.2	30	25	28
Cleveland to Kalamazoo	250	50.6	35.7	35	30	28
Chicago to St. Louis	280	55.2	39.1	38	33	32
Youngstown to S. Bend	320	59.8	42.6	40	35	43
Buffalo to Chicago	500	77.1	62.1	59	54	58.5
Fairless, Pa. to New York	80	28.8	20.7	20	16	19
Weirton to Fairmont, W. Va.	105	36.8	24.2	24	19	22
Monessen to Cumberland, Md.	140	39.1	28.8	28	23	25
Sparrows Pt. to Newark	200	48.3	35.7	33	28	30
Pittsburgh to Harrisburg	250	50.6	41.4	37	32	35
Johnstown to Philadephia	280	55.2	43.1	40	35	35
Coatesville to Pittsburgh	320	59.8	46.0	43	38	37.5
Newport, Ky., to Rochester	500	77.1	62.1	62	57	62

*Three per cent federal tax not included

meet any form of competition offered by the railroads."

So, either way—with rate reductions or without—steel shippers and steel consumers will benefit from the competition for the steel product transportation dollar.

Limits of Reduction—The eastern railroads maintain that the major rate adjustments which they have submitted to ICC are necessary in order to make rail transport competitive with motor carriers. The rate reductions range up to 20 per cent on steel product shipments in the Official Territory (bounded generally by the Mississippi river, Ohio river and Atlantic ocean). As shown in the table on p. 39, they apply on two weight levels—40,000 lbs. (rates to be about comparable with motor carrier rates) and 80,000 lbs. (rates to be about 5 cents per 100 lbs. under motor carrier rates for distances over 100 miles).

The proposed rate reductions would not apply to all steel products, these being "selective" or "restrictive" reductions. Generally the changes apply to bars, reinforcing bars, bolts, nuts, rivets, castings, forgings, hoops, nails, pipe, pipe fittings, pipe hangers, plates, tin mill black plate, floor plate, structural shapes, coiled rods, track material, fence posts, roofing, wire rope, screws, sheets, skelp, slabs, spikes, strip, tin and terne plate, boiler tubes, seamless and welded tubing, washers and certain wire products. In toto, these amounted to about a 40-million-revenue-ton plum in 1953 in the Official Territory.

Declining Cut — Eastern railroads claim the rate reductions do no more than put them back on equal competitive footing with the truckers. The railroads point to their decreasing share of iron and steel product tonnage transport. In 1950, they say, railroads were handling 47.8 per cent of combined rail and truck traffic in manufactured iron and steel articles and trucks handled 52.2 per cent. Now, say the railroads, trucks are handling 55 per cent of such traffic and the railroads only 45 per cent. And this is important traffic to the railroads, accounting for 7.12 per cent of gross revenues in 1952 in the Official Territory.

Some idea of the savings to you under the proposed rates can be had from a couple of hypothetical shipments. On an 80,000-lb. shipment from Sparrows Point to New York, for example, the savings would amount to $3.06 per ton; from Cleveland to Rochester, N. Y., savings per ton would be $2.72; and on a shipment from Pittsburgh to Philadelphia, savings would amount to $3.42 per ton.

Defense of a Nickel—The 5-cent lower rate on 80,000-lb. rail shipments that would result from the proposed adjustments would actually work out to be about equal to truck rates. That's because of extra handling necessary in rail shipments, which shippers pay for. Rail shipments of certain types must be shrouded, blocked and often require more inplant handling at the point of destination. The 5-cent difference no more than makes up for these extras, railroaders claim.

The rate differential would not be sufficient in some cases to divert steel traffic back to rails. One eastern company, taking 100 to 1100 tons monthly, says it will continue to take truck deliveries 100 per cent because of better control of delivery and better control of inventory. A Cleveland firm, however, says if the new rail rates go into effect it will go back to rail shipments for as much as 80 per cent of its steel. This firm claims rail shipments are easier for it to handle but that it couldn't ignore the existing cost difference and has been shifting to trucks up to now.

To Hold a Giant

Another 360-pound link is about to be joined to the 1800-ft anchor chain being forged at the Boston Naval Shipyard for the aircraft carrier, *U.S.S. Forrestal*. Chain's breaking point is rated in excess of 2½ million pounds

The Interstate Commerce Commission has several avenues of action open to it on the current rail rate adjustments. One is a suspension of decision beyond the proposed Mar. 26 effective date of the new rates. ICC has done that with a similar rate reduction on aluminum and aluminum products proposed by the railroads. The aluminum case is still under study. Another possibility is that the new rates will become effective this month.

Tenor of the Times — In any event, ICC is on the hot seat. It does not want to start what the truckers call "destruction rate reductions." Yet, in a day when business needs encouragement, a spur to legitimate competition in the transportation industry might have a salutary effect on all concerned.

Should the proposed rate reductions fail to be accepted, traffic managers of metalworking firms still might well review their traffic patterns this year. The railroads have been studying and gradually revising rates over the country for the past 18 months. Recently the railroads have gone to metalworking firms and asked how rail service for that particular firm could be improved. Truckers, because their principal advantage has been flexibility, have let the rails carry the burden of proof thus far in the fight for steel transportation dollars. But the truckers are now ready to review special problems of individual firms, too.

As a result of this competitive battle in transportation, basic functions of the traffic department—routing, loading, rates, and controlling movement of goods—take on revitalized importance. If your traffic department is on its toes, it should this year get raw materials in your plant and your products on the market more easily, more quickly and more cheaply.

To keep the plants modernized and the steel rolling . . .

U.S. Steel Urges End of Double Taxation

A stockholder survey shows that 68 cents of each potential dividend dollar it earns goes to the U. S. because of double taxes. Output and shipments soar in 1953

DOUBLE TAXATION is claiming more than two-thirds of the potential dividend dollars earned by U. S. Steel Corp.

The corporation's annual report points out that such a levy is a serious drain on investors. In the long run continuing double taxation would affect the capital investment in U. S. Steel. Its 300,000 individual and institutional stockholders have an invested average of about $8000 each to provide the tools of production for about 300,000 employees.

The Mechanics—U. S. Steel developed its double-taxation information through a stockholder survey begun late in 1953. A response from about 140,000 individual stockholders permitted a grouped analysis of their income status and of the amount of federal taxes they paid on U. S. Steel dividends received in 1952.

Reports show the corporation itself in 1953 paid 59 cents in federal taxes out of each dollar potentially available for dividends. The remaining 41 cents, when paid out in dividends, was then subjected on the average to a personal income tax reduction of 21 per cent, equivalent to 9 cents, or a total tax of 68 cents.

U. S. Steel's expenditures for needed additions and replacements for its facilities amounted to $361.4-million in 1953. Since 1945 property expenditures have amounted to $2.2 billion. At Dec. 31, 1953, the amount required to complete all replacements and additions then authorized was an estimated $327-million.

Production—With its new and expanded facilities in production, U. S. Steel produced 35.8 million net tons of ingots and castings in 1953 and operated at a rate of 98.4 per cent of capacity. In 1951 the previous record was established, 34.3 million tons. During last year, an all-time record of shipments totaled 25.1 million tons.

Income for 1953 was $222.1 million, representing a return of 5.8 per cent on sales, compared with income of $143.6 million in strike-torn 1952 and a return of 4.6 per cent on sales. Sales in 1953 were $3861 million compared to $3137.4-million in 1952 and $3524.1 million in 1951.

Newport Wins Patent Round

Newport Steel Corp., Newport, Ky., won the first round of a court fight with Cold Metal Products Co., Youngstown, which charges Newport with infringement of some important Cold Metal patents for hot-rolling strip steel.

The suit against Newport is said to involve more than $1 million in infringement claims and will have a bearing on some other infringement cases and some licenses issued by Cold Metal.

"White Collar" Cutbacks Made

"White collar" employees have been placed on short work weeks in Youngstown at Republic Steel Corp. and Youngstown Sheet & Tube Co. because of reduced steel operations.

Youngstown Sheet & Tube office employees in order, payroll and similar departments were recently cut back to four-day weeks, and similar cutbacks at Republic have been in effect for some time.

Ohio State Employment Service officials in Youngstown report that 6249 persons have entered claims for compensation, highest number in several years. Employment, however, is expected to pick up this month as construction work, including the Ohio Turnpike project, and other outdoor jobs get under way.

According to the United Steelworkers of America-CIO, 12 per cent of 65,000 steelworkers of the area are unemployed and another 17 per cent are working short work weeks.

Chrysler Hits Union Tactics

Chrysler Corp. seeks a court injunction to restrain Dodge Truck Local No. 140 (UAW-CIO) and others from intimidating foremen, impairing their effectiveness as supervisors and interfering with military and civilian truck production at the Mound Road Dodge Truck plant.

The complaint alleges conduct unbecoming a member of the union acts that interfere with the foreman's line of duty in management and with the present Chrysler-UAW labor agreements. These interferences pertain to the report-

ing and recording of employees' delinquencies; keeping of order and discipline; maintenance of truck production; training and instruction of employees; discovery and correction of work defects; and representation of management in dealings with its employees.

As to the foremen themselves the company charges that the union has tried and intends to try other employees for acts they properly performed as foremen both for the company and in accordance with the Chrysler-UAW agreement. It further charges the union with subjecting present foremen at the truck plant to the threat of reprisal at the hands of the union for properly performing their managerial duties.

Besides the union the complaint named as defendants four of the local's officers and four members of the plant shop committee.

AEC Plans Five New Reactors

The Atomic Energy Commission announced that it plans to build five more atomic reactors to produce electric power. This is in addition to the $40-million to $50-million plant the government already has contracted for with Westinghouse Electric Corp.

The new reactors will be of different sizes and types aimed at discovering the best way to produce commercially usable electric power from the atom. AEC hopes that one or two of the new reactors may actually produce economical power in commercial quantities, but all will contribute to the scant store of atomic power information now available.

Before the AEC construction program can go into operation, it will have to get congressional approval and fund appropriations. So far, Congress has appropriated funds only for the reactor being built by Westinghouse. The firms who would build the five additional reactors will not be decided until Congress acts.

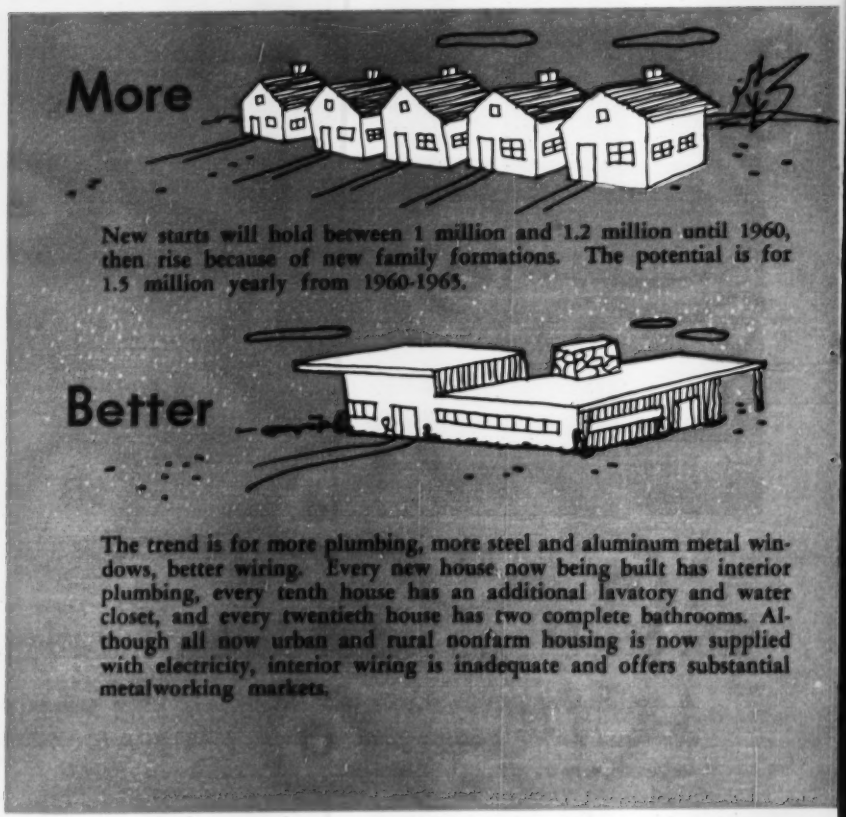
Bomb-proofing Industry

The government's offer for 100-per-cent rapid tax write-off for protective construction has been extended to defense-supporting plants in all 193 target areas, Office of Defense Mobilization announces.

Formerly, only plants in the 70 critical target areas designated by Federal Civil Defense Administration were eligible for the write-off. Cincinnati Milling Machine Co., Cincinnati, was the first in the nation to take advantage of the write-off for its proposed $500,000 bomb-proof facility (see STEEL, Oct. 12, 1953, p. 93).

Arthur S. Flemming, defense mobilizer, states, however, that it's the government's policy to encourage construction of new defense plants away from probable target areas. To be eligible for a 100-per-cent write-off certificate, a facility must produce the material or service for which ODM has established an expansion goal, whether or not the goal has been reached. The former $25,000 minimum expenditure requirement has been eliminated under the new order.

HOUSING: A MARKET GROWING


More
New starts will hold between 1 million and 1.2 million until 1960, then rise because of new family formations. The potential is for 1.5 million yearly from 1960-1965.
Better
The trend is for more plumbing, more steel and aluminum metal windows, better wiring. Every new house now being built has interior plumbing, every tenth house has an additional lavatory and water closet, and every twentieth house has two complete bathrooms. Although all now urban and rural nonfarm housing is now supplied with electricity, interior wiring is inadequate and offers substantial metalworking markets.

Cement Capacity Climbs

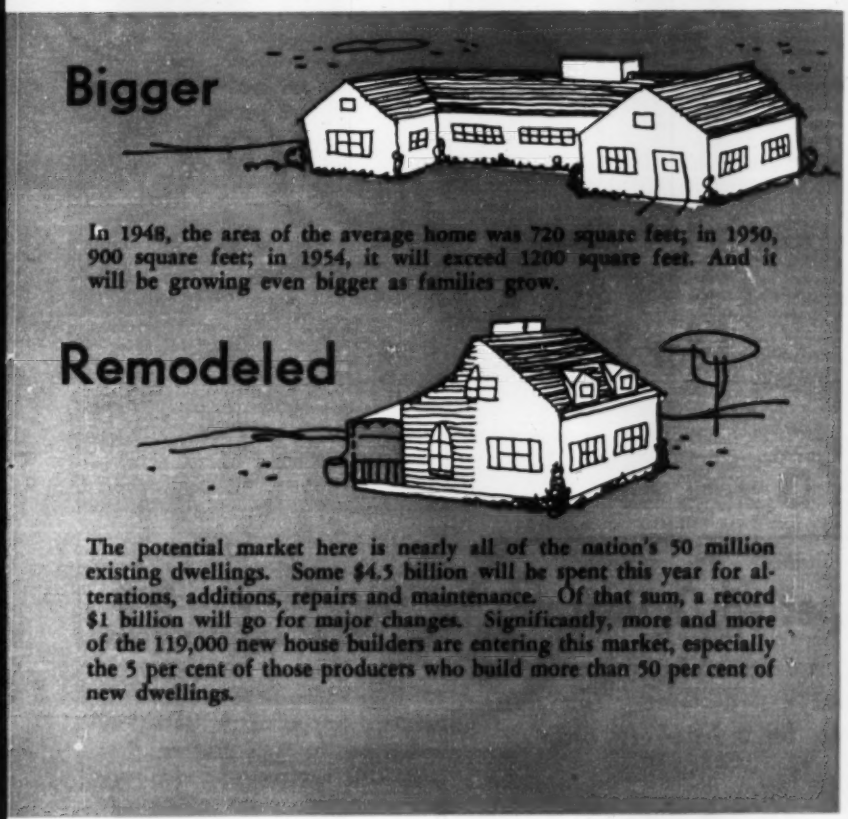
Expansion goal for Portland cement production, based on capacity, has been upped 4.5 million barrels per year by the Office of Defense Mobilization. Expansion will be divided between Michigan—its increase is 2.5 million barrels—and Southern California.

As the Michigan facilities have already been built and placed in operation all this action does is grant 5-year amortization on the plant and equipment. The Southern California expansion program still is to be carried out.

Instrumentmakers: Imports Hurt

The American precision instrument industry must have government protection from "unfair" competition of foreign items produced by cheap labor if it is to be in a sound and healthy condition in event of a war emergency, representatives of the industry reported to Business and Defense

IN FOUR DIRECTIONS


Bigger
In 1948, the area of the average home was 720 square feet; in 1950, 900 square feet; in 1954, it will exceed 1200 square feet. And it will be growing even bigger as families grow.
Remodeled
The potential market here is nearly all of the nation's 50 million existing dwellings. Some $4.5 billion will be spent this year for alterations, additions, repairs and maintenance. Of that sum, a record $1 billion will go for major changes. Significantly, more and more of the 119,000 new house builders are entering this market, especially the 5 per cent of those producers who build more than 50 per cent of new dwellings.

Services Administration, U. S. Department of Commerce.

Products under the most severe pressure from foreign competition include: Optical instruments, particularly microscopes; analytical laboratory balances; analytical laboratory weights; and laboratory glassware.

Industry representatives also reported that they are losing ground in export trade partly because of delays in obtaining export licenses.

Who Can Do It Best?

To take the military out of competition with private business wherever practical, the military departments will begin a study of 11 kinds of military-operated commercial and industrial-type facilities.

A report on government operation of scrap metal baling and five other activities is to be made within five months. The study on which the report is to be based will consider the choices of obtaining the product or service from private business, combining similar activities, releasing a facility, or holding it in a stand-by status.

Costs and other standards for use in the study have been set up.

Oil, Gas Reserves Hit New Peak

Proved reserves of liquid petroleum and natural gas rose to new all-time peaks in 1953 despite the highest production rates in history, say the American Petroleum Institute and the American Gas Association in their joint annual report on the nation's known supplies of oil and gas.

Proved reserves of liquid petroleum now total 34.3 billion barrels and those of natural gas 211.4 trillion cu ft, the report stated. These are net increases of 1.4 billion barrels in liquid petroleum and 11.7 trillion cu ft in natural gas reserve. Production of liquid petroleum was estimated at 2.6 billion barrels and that of natural gas at 9.2 trillion cu ft.

Stampers Press To Sell

Business has been better than expected, but they're preparing for a harder push ahead

LIKE A MAN on the last day of his vacation in Florida, the metal stamping industry has been enjoying relative prosperity but is taking a conservative look at the future.

Optimistic—"Shipments for the past six months held up better than expected. They were about 25 to 30 per cent over the 1947-1949 base period and slightly ahead of 1952," said Orrin B. Werntz, managing director of the Pressed Metal Institute, at the organization's fifth annual, spring technical meeting in Cleveland last week.

Mr. Werntz explained that the leveling-off process has not hit the industry because the Korean war was not a particular boon to stampers.

But—Orders were off in January, and February reports aren't in, Mr. Werntz says. For the past three or four months, stampers have been dipping into backlogs to some extent.

"I'll put it this way," he declares. "Our future is tied to what the public buys." Of the reporting members of the 200-company institute, 35 to 40 per cent supply the auto industry. They were the first to feel the pinch. Others are getting ready for it.

Belt Hitching—So the 250 men attending the technical meeting had "hard sell" on their minds, and PMI had a program tailored to fit their needs.

Sample: If there is a restriction of business, stamping runs must be shorter and cheaper. The closing session of the meeting dealt with the progress and possibilities of using plastic dies.

USAF Turns in a Lot of Scrap

The Air Force collected a whopping 127 million pounds of scrap metal in 1953. Its drive to clear warehouses of supplies and equipment beyond economical repair pushed collections to the highest level in history, except for the years immediately following World World II.

Expenditures on New Plant and Equipment by U. S. Business*

(Millions of dollars)

	1951	1952	1953	1954
Manufacturing	10,852	11,632	12,276	11,410
Durable goods industries	5,168	5,614	5,821	5,220
Primary iron and steel	1,198	1,511	1,340	990
Primary nonferrous metals	310	512	456	330
Electrical machinery & equipment	373	386	481	490
Machinery except electrical	683	701	803	720
Transportation equipment	1,070	1,066	1,168	1,430
Stone, clay and glass products	397	330	339	300
Other durable goods	1,136	1,107	1,233	960
Nondurable goods industries	5,684	6,018	6,455	6,190
Mining	929	985	1,011	1,040
Railroad	1,474	1,396	1,312	940
Transportation, other than rail	1,490	1,500	1,464	1,400
Public utilities	3,664	3,887	4,548	4,430
Commercial and other	7,235	7,094	7,778	8,010
Total	25,644	26,493	28,391	27,230

* Excluding agriculture. Discrepancies in totals are due to rounding of figures
Source: Securities & Exchange Commission, and Commerce Department

Capital Outlays: Unexpected Optimism

Business in 1954 expects only a 4-per-cent drop from 1953 in new plant and equipment expenditures. Just three months ago the prospects were for a 9-per-cent drop

BUSINESSMEN are planning capital investments this year of $27.2-billion, only 4 per cent less than they spent in 1953 (see the table).

And the prospects now for 1954 look 4.6 per cent better than they did only three months ago (STEEL, Dec. 21, p. 37) when the consensus was that this year's outlays would hit $26 billion.

Manufacturers Drop — In their joint annual survey, Securities & Exchange Commission and the Department of Commerce find that manufacturers' programs call for an outlay of $11.4 billion, 7 per cent below last year. Mining and commercial companies each expect to spend about 3 per cent more than they did in 1953, while scheduled spending of $4.4 billion by the public utilities marks a slight reduction from last year. The sharpest cutback — 25 per cent — is planned by the railroads.

Actual expenditures of $7.7 billion in the fourth quarter of 1953 brought capital outlays for the year to $28.4 billion, or 7 per cent above 1952. The actual expenditures for 1953 proved to be larger by 5 per cent than the planned outlays indicated by business in the survey of 12 months ago. A small part of that gain may be accounted for by the slight rise in prices of capital goods during 1953.

Where Are Declines?—The 7-per-cent dip in manufacturers' outlays planned for 1954 results from a greater reduction in the programs of durable goods industries—10 per cent—compared with a 4-per-cent decrease expected by nondurable goods industries. The survey also finds that the small and medium firms expect relatively larger declines in capital outlays this year than do the larger companies. The only durable goods industry planning a significant increase in expenditures in 1954 is the motor vehicle and other transportation equipment group, where outlays are scheduled at about 20 per cent more than in 1953.

In manufacturing, every major durable goods industry expects its 1954 sales to decline from last year's rate. In aggregate, durable goods producers responding to the U. S. survey expect their sales to be some 8 per cent below 1953. Producers of nondurable goods anticipate a 3-per-cent gain.

New Water Purifier Developed

A new water purification method, Hyla process, has been introduced by Salem-Brosius Inc., Pittsburgh. Employing a catalytical technique, the Hyla process effectively kills bacteria and eliminates bad odors and taste, officials report.

The process is expected to find applications in industry and agriculture which are not confined solely to water treatment. Salem-Brosius has obtained all American manufacturing and sales rights to the process from its inventor, Dr. Karl Hofer, Geneva, Switzerland.

Leasing—Its Pros and Cons

Need new equipment? Today's competitive economy requires the most modern tools and machinery available. The necessity for increasing efficiency and lowering costs makes a sound re-equipment program imperative.

Leasing may be one way to finance your modernization. Next week, Mar. 29, STEEL starts a three-part series on leasing's pros and cons, plus pointers on how to get started with the marketing device. Not everyone should lease, but everyone should consider the possibility because here's one means of broadening markets if you're a builder or of getting the latest equipment at minimum capital outlay if you're a user.

Clark Controller

Competitive times emphasize efficient production so . . .

Controlmakers Welcome Competition

Electric motor control makers foresee a dip in industry sales for 1954, followed by another crest as automation spreads. Selling is top short-term problem

ELECTRIC MOTOR control manufacturers think they stand in a comparatively good position for the competitive times ahead. They're not standing still, however.

Two trends in industry likely to keep the control business healthy: 1. Modernization of existing control systems and 2. automation of new systems.

Modern Design—Electrical and power requirements of industrial plants have skyrocketed since World War II at times almost out of control. Consequently many plants are finding control systems which grew like Topsy are no longer adequate. That's where modernization comes in.

Much has been said of the trend toward automation. Automatic machinery means in great part automatic machine controls. Here's a strong industry trend which will help industry dollar sales this year and which certainly will be felt more in the near future.

Small Slip—Does this mean the electric motor control industry will have greater dollar sales in 1954 than in 1953? No. Industry dollar sales will be off from 8 to 14 per cent, say manufacturers, to about $300 million for the industry.

A survey of major control customers shows machine tool and machinery business definitely off; steel mill sales off; mining industry off; scrap industry (electromagnets) sharply off; chemicals industry still good; mining industry off; building industry holding up well; petroleum industry still strong; automotive firms a question mark though sales are stable to this point; and the air-conditioning industry considered decidedly good for 1954 and expected to take up much of the slack.

Critical Year—These reports indicate that, though motor controlmakers fortunately stand squarely in metalworking's path to more automatic control, 1954 will separate the salesmen from the order-takers.

Allis-Chalmers Mfg. Co.'s Control Division won't change its sales policy but is trying to hire more engineers for the home office. Reason: Purchasing agents used to contact only two or three control manufacturers for quotations; now inquiries are being sent to perhaps 15. That has increased the volume of work.

Back Up—Cutler-Hammer Inc. is strengthening both the home office force and adding field men. Electric Controller & Mfg. Co. puts emphasis on backing up the outside offices with technical aid from engineers from the home office when a complicated job comes up for figuring.

Westinghouse Electric Corp.'s Standard Control Division has a six-truck Caravan of Control Ideas cruising the country. These are display coaches which carry a full complement of salesmen. Arrow-Hart & Hegeman Electric Co., one of the companies looking for 1954 business on a par with 1953, has been building up its sales force for the past six years and doesn't plan to reduce its forces in any way.

More Ways—These are only a few representative ways control manufacturers are girding for the heavy sell. Other firms, such as Clark Controller Co., plan to put more emphasis on their standard control lines, pushing hard on improved features. Still others, like Square D Co., are stressing the merchandising angle. Recognizing many users now feel confident enough to buy motors in one place and controls in another, Square D packages its five or six basic back mounting plates and three different types of actuating arms for limit switches separately. Distributors can then select the right arm with the right plate to produce the right mechanism.

Another sign of the times: The 10-per-cent escalator clause in sales contracts running a year or less has all but disappeared. Prices are still firm, but competition is killing off these vestiges of wartime inflationary selling.

Bright Future—In the long term, electric motor control manufacturers express nothing but optimism. Allen-Bradley Co. has been through a whole series of expansions since World War II and just recently opened a Canadian plant. General Electric Co. says it plans to build a new multimillion dollar plant in Virginia as a result of forecasted higher demands for large industrial electrical control equipment.

By E. C. KREUTZBERG *Washington Editor*

Mobilization Pattern: Industry Will Know Its Job in Advance

A FRESH START is being launched by the Defense department to outline industry's mobilization duties in case of an all-out war. Under the department's revised Production Allocation Program, manufacturers will be informed in advance of what they are to produce, for whom and how much.

Talks are already under way with automobile manufacturers, and the advance planning of other industries will be reviewed and brought up-to-date. Manufacturers who have not yet been approached can find out how their advance plans are affected by contacting the ASPPOs (Armed Services Procurement Planning Officers) located at any of the 130 armed services procurement centers scattered over the country. Companies which have not done such planning and are definitely in the "hard goods" category, either finished products or components, can consult the ASPPOs as to where they fit in. The great majority of companies eligible for such advance mobilization planning are in the metalworking field.

CHARLES S. THOMAS
. . . To Be Secretary of the Navy

In revising the Production Allocation Program the most important change is the lodging of responsibility for carrying it out with top management in the armed services—namely, the Army's Assistant Chief of Staff, G-4 logistics, the Navy's Office of Naval Materiel, and the Air Force's Deputy Chief of Staff for Materiel. In contrast with the lack of balance which characterized advance planning in the past for lack of top direction, it is hoped this shift will result in fairly early assignments of the battle stations of those companies who will produce critical military end items.

The Criteria Are Changed . . .

The other major change is the adoption of criteria for the selection of military end items to be subjected to advance planning. Planning hereafter will be restricted to those military end items of supply which in wartime are essential for survival and retaliation, health, and combat efficiency.

To qualify, they must conform to one or more of these criteria: 1. Items requiring a long lead-time or long manufacturing cycle; 2. items not currently in production or required in quantities far in excess of peacetime production; 3. items requiring the conversion of an industry or of a number of plants within an industry; 4. items involving materials or techniques essentially different from those in current use; 5. items on which industry does not have production experience; 6. items requiring large quantities of critical or strategic materials.

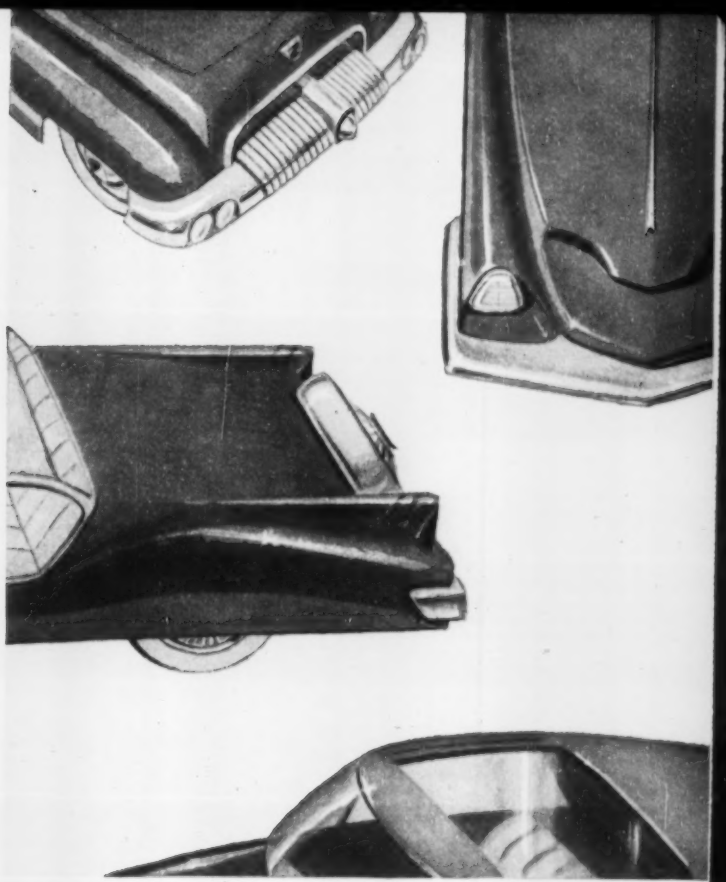
First things first is the essence of the program. There will be no more advance planning for items normally procured on the open market or "off the shelf" without undue delay or difficulty. Items customarily classed as "comfort" and "morale" types are definitely out of the planning program. Whereas in the past, advance plans involved some 30,000 companies, the number of companies that will emerge finally will be smaller.

Priority for Military Items . . .

The new directive makes it mandatory to give priority in advance planning to some 1000 military end items in the recently completed "Preferential Planning List." This classified list includes not only finished end products, such as types of aircraft, but also components whose lack might cause production bottlenecks under full mobilization. The list mentions not only the items but also the quantities of each regarded as necessary in the first three years of war. This list, of course, is subject to annual review and revision.

Completed mobilization plans for production of end items which do not meet the new criteria will not necessarily be discarded. The Pentagon feels that it will "cost nothing" to keep these completed plans on file. But no uncompleted plans will be completed unless the end products covered conform to the new criteria.

ROBERT ANDERSON
. . . To Be Deputy Defense Secretary



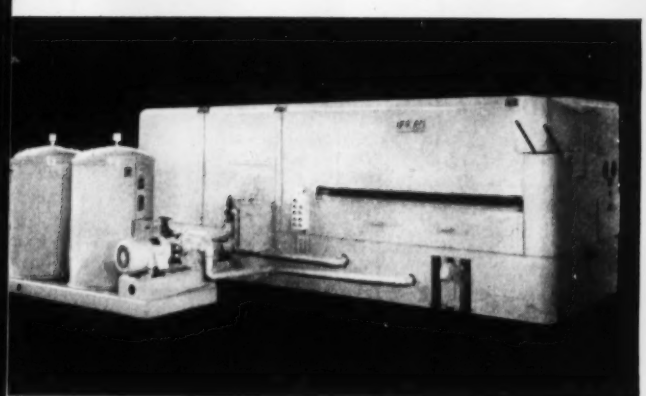
To Look their Best

AUTOMOBILES, Too Require A Beauty Treatment

The Beauty Salon takes care of the lady. The McKay Flex-Roll Processor takes care of the automobile. More than 90 percent of all the steel used in modern motor car bodies, doors and fenders is run through a McKay Flex-Roll Processor prior to drawing.

The Flex-Roll works the steel, imparting a uniform condition throughout the sheet, which allows it to be drawn without showing strain marks. This results in a smoother, blemish-free surface, adding to the beauty of the new car finish.

Many other industries, where deep drawing is required, are finding the McKay Flex-Roll works as well for them, minimizing rejects and giving their products a better finish. If deep drawing is part of your business you can't afford to be without a McKay Flex-Roll Processor. Write today for details.



e McKay Flex-Roll Processor

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

McK

ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES

the same ingredients—sure . . .

but what a difference in the results!

Take the same recipe, the same instructions—but different cooks. Ask each to bake a cake. Theoretically the *results* should be the same.

But are they? Seldom, if ever. The reason, of course, lies in that intangible something—that "feel". Good cooks have it while others do not.

Bolts, nuts and screws, made by different companies, are also theoretically alike. Technically, they should be. But some brands are preferred over others. Where, then, lies the difference? It's not easy to define. But we at Lamson & Sessions like to believe it's an extra measure of helpfulness—a will to serve customers just a bit better than the other fellow—that makes the big difference.

Or maybe it's just that our personnel work harder to please you; or that Lamson engineers respond cheerfully and successfully in solving customers' fastener problems.

Perhaps we can summarize it by saying we try to do everything possible to make it more *pleasant* and *profitable* for folks to do business with us.

We feel that those intangible "extras" you get with every Lamson "bolt" are important . . . important to us and to you!

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Precision made for fast, economical assembly.

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Ideal for blind or hard-to-reach places.

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Choice of round, pan, truss, flat oval, hexagon and Phillips heads.

CAP SCREWS
"1035" Hi-Tensile Heat-treated steel.

SQUARE AND HEX MACHINE SCREW NUTS
Also semi-finished, hot pressed and cold punched nuts.

LOCK NUTS
Economical, vibration proof. Can be used repeatedly.

COTTER PINS
Steel, brass, aluminum and stainless steel.

"1035" SET SCREWS
Cup point type, hardened and heat-treated.

U.S. Tool Exports Dip Dangerously Low

Foreign demand for U. S. machine tools has dipped to 7.6 per cent of total orders, says National Machine Tool Builders' Association

PITY the prospective foreign buyer of a U. S. machine tool.

If a French manufacturer, for example, wants to buy an American-made machine tool, he must be ready to jump a series of hurdles in order to reach his purchase goal.

Last Resort—Before he can buy dollars to pay for the U. S. machine, he must get an import license from the French government. He is likely to be told, "Go buy a French machine, or a German machine, or an Italian machine, or a British machine if you possibly can. Buy American only as a last resort."

Should the French manufacturer stick with his desire, obtain the license, buy the dollars, order the machine, the duty on it may add as much as 55 per cent to the cost by the time the machine is laid down on the French dock. And delivery may take longer than expected since the American machine tool manufacturer must secure from the U. S. government an export license.

Amazing Loss—This case is typical of the situation not only in France but in various foreign countries. It demonstrates the basic causes for an amazing loss of export markets by the American machine industry, says the National Machine Tool Builders' Association.

During the 35 years from 1918 to 1952 exports averaged 20.2 per cent of U. S. machine tool production. In 1953 foreign orders were only 7.6 per cent of the total, a new low. Machine tool imports into the U. S. rose from $1.8 million in 1948 to almost $50 million in 1952.

Real Problem—NMTBA goes on record as saying, "The problem is not one of the American tariff." The problem is one of removing these nationalistic preferential restrictions and policies imposed by foreign governments on U. S. products.

The least that can be done, says NMTBA, is to reverse U. S. policy which as of now approves of these barriers to U. S. export trade.

Brief European Roundup

Swedish exporters have begun cutting steel prices by about $3.90 per metric ton. Montanunion of the European Coal & Steel Community has intentions of giving up price control on iron and steel scrap. Iron ore mines in West Germany have shortened hours; open-pit iron ore mines in Salzgitter have been closed some months. In the Ruhr district 81 blast furnaces are operating at present compared with 99 a year ago.

Spain To Buy Farm Equipment

The government of Spain has been granted dollar aid by the Foreign Operations Administration for purchase of reforestation and reclamation machinery and equipment.

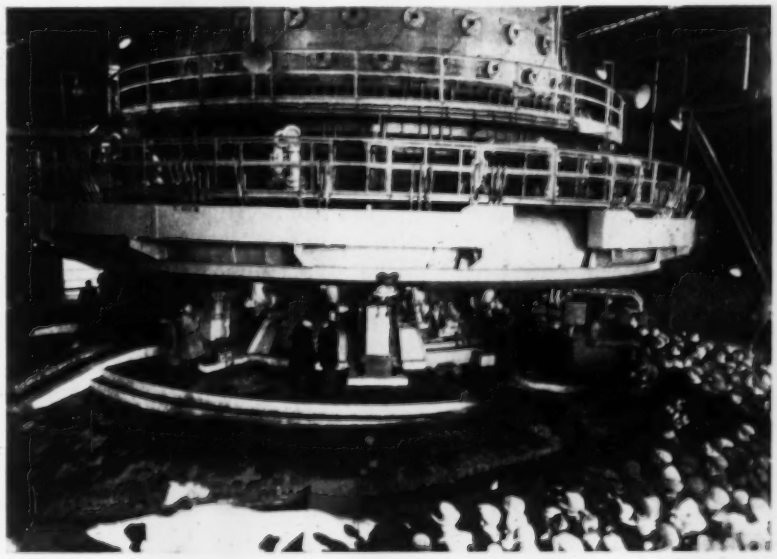
1. $435,000 for track - laying tractors.
2. $224,000 for tractor engines and spare parts.
3. $4000 for rotary cutters and spare parts.
4. $250,000 for wheel-type tractors.
5. $397,000 for scrapers, rippers, bulldozers, excavators, graders, and similar equipment.

West Germany To Get Tax Cuts

Chancellor Adenauer's government has sent a tax reduction bill to the German parliament which calls for income tax cuts of from 6.4 to 41.6 per cent and a corporate tax cut of 25 per cent. Approval is considered almost certain.

Finance Minister Fritz Schaeffer says the cuts will reduce government revenues by $547 million, or 8 per cent of current income. But, he says, the new budget to begin Apr. 1 takes these losses into account.

The cuts will leave West Germany still with a high tax burden.



Big One Blown In in England

One of the largest blast furnaces in Britain, the "Elizabeth 1" was blown in on Mar. 1 at Scunthorpe, England. With a diameter of 27 feet and a capacity of 6000 tons per week, the furnace will produce in one week as much pig iron as the first Lincolnshire furnaces made in a year in 1873. The "Elizabeth 1" is part of an $85-million expansion program to increase United Steel Companies Ltd. steel output from 1953's record 2.3 million tons to 2.5 million tons

WHAT'S YOUR ALLOY STEEL PROBLEM?

SELECTION?
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MACHINABILITY?
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TOOL LIFE?
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Check your problem . . . or problems. Then call in Republic's 3-Dimension Metallurgical Service.

The man you meet will be the Republic Field Metallurgist. He comes to your plant, studies your product, examines your production methods. His report goes back to the Republic Mill and Laboratory Metallurgists.

These three specialists then work together to diagnose the trouble. From their wide knowledge of alloy steels, how they respond to forging, to heat treatment, to any work or process, they make recommendations. Not general ones, but those suitable for your plant and your particular problems, based on efficiency. And they stay within, or below, your cost limits. The results? Higher quality, greater output, economy.

Scores of Republic customers already have attained these benefits by taking advantage of this service. Ask your Republic salesman to call in his 3-Dimension Metallurgical Service. It's yours for the asking.

...combines the extensive experience and coordinated abilities of Republic's *Field*, *Mill* and *Laboratory* Metallurgists with the knowledge and skills of your own engineers. It has helped guide users of Alloy Steels in countless industries to the correct steel and its most efficient usage. IT CAN DO THE SAME FOR YOU.

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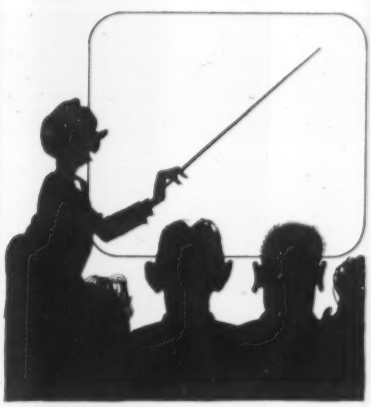
Marketing Efforts Lagging?

Try Personal Contact Selling

IF YOU HAD A NEW PRODUCT you felt just couldn't miss, how would you go about getting it on the market?

The Bellows Co., Akron, used four salesmen, each carrying a 200-foot movie of how the product, Bellows' first air motor, could increase a manufacturer's production. In the dozen years since, Bellows has boosted sales from zero to over the $7-million mark last year. And the curve is still pointing up.

Opening Doors—The company's snow-balling to prosperity was almost immediate. A case in point is the experience of one of the salesmen—who, incidentally, was an interior decorator by trade. He went into a General Electric Co. plant and gained permission to show his film to five men. The film sparked interest; more men were called to see what this new air cylinder with built-in precision controls would do. By the end of the day the salesman had shown the film seven times. Asked to return the next day, the salesman was pummeled with technical questions from engineers. Not being



an engineer, he answered: "You're the engineers, you figure out the applications."

GE became a big customer, and so have 20,000 other manufacturing plants in practically all types of industry. "Our chief problem," Herbert B. Link, Bellows' president, says, "was one of education. Air tools were not new, but they were generally associated with big cumbersome applications. We had to prove that our product was a precision-controlled motor."

Tail Wags the Dog—Bellows went into the air motor business about the same time World War II began. The company had been in the sign business since 1911; because of the cyclical nature of contractual sign business, officials had been seeking a product to level off production ups and downs. Metal restrictions curtailed sign production during the war. Following the war, Bellows resumed its sign business to complete several contracts, but pneumatics which began as a production-leveler took over as the major item.

"The war, because of its emphasis on production speed-up, helped us considerably in our efforts," Mr. Link points out, "but our strong point was our personal contact technique which we employed in our sign business. We believed that this method was superior to the catalog and supply house method sales of air cylinders which was common practice then."

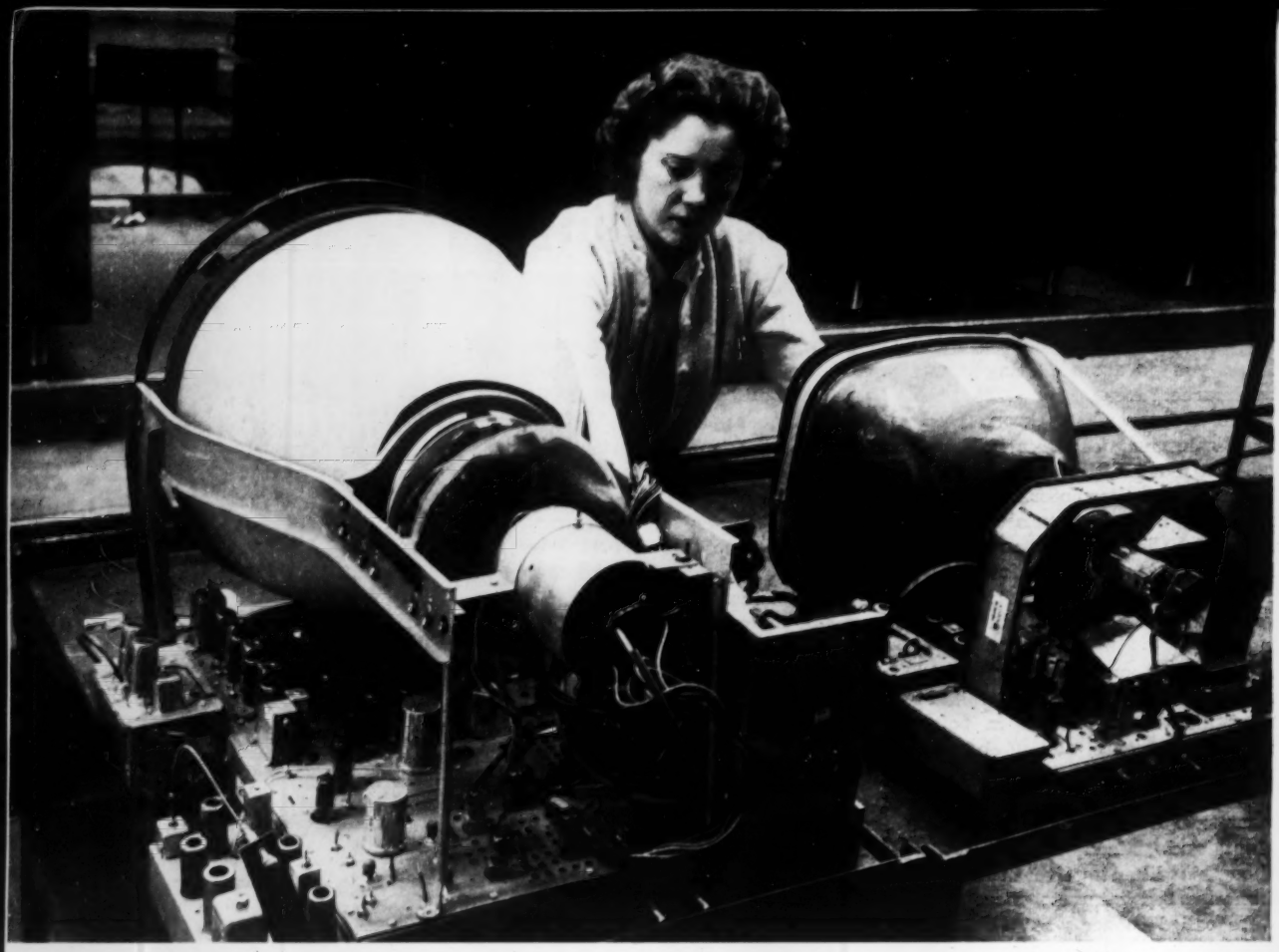
Plus Factors—Personal contacts, too, offered another big advantage. A salesman in a manufacturer's plant talking over problems with engineers soon saw the possibilities of other air tool applications. Manufacturers frequently presented special problems and asked if they could be solved. This led to Bellows expansion into other lines—controlled air power drill press feeds, air vises, rotary tables, multiple drilling units, jigs and fixtures, and work feeders. Today, company products combine the use of air, electric and hydraulic controls.

An important factor in personal contact selling, officials point out, is to try to get to the men who'll be directly connected with your product—product engineer, methods engineer, superintendent. Another key for the sales lock is to spot one or two men who show more than casual interest in your product. Concentrate on them and the chances are that they'll do much toward carrying the ball for you when it counts.

Movie Pattern—In addition to direct mail and business journal advertising, Bellows still uses the movie as a key factor in its sales program. Last year over 20,000 feet of film were taken at various plants across the country for a movie now being made up. These films are designed to show as many uses for Bellows products as possible to plant engineers and other key personnel in factories, to engineering organizations and to colleges and universities.

The end of World War II brought new emphasis on cost cutting, Bellows officials explain. "Knowing we had a product which could do just that, we emphasized cost cutting." The company kept growing, and today has four factories and over 100 field engineers selling its products. The emphasis the company places on personal contact selling is illustrated by the fact that one out of every five Bellows employees is a field engineer salesman.

Sign Alertness—Bellows, too, is always alert to signs of the times—production increasing during the war, cost cutting afterward. A new era is taking shape now—automation. "Our products have played an important part in this new trend too" says Bellows' president. "And that's what our movies and salesmen will continue to stress when they knock on company doors in the future."



Westinghouse color television receiver dwarfs a comparable black-and-white model

Westinghouse Adds COLOR to Production

WESTINGHOUSE Electric Corp. has begun line-production of color television receivers at Metuchen, N. J., and is offering them for public sale at retail stores in New York City and northern New Jersey. The suggested price of the 15-inch tube set is $1295.

The high cost of tubes, with rejections now averaging 25 per cent, contributes much to the $1295 retail price of the color TV receiver; a color picture tube costs three to five times more than a larger black and white tube. In addition, a color receiver requires more than twice as many parts as a monochrome set and almost 150 more pounds of steel and metal.

Elaborate Test Facilities — The 400-foot assembly line now operating will eventually be staffed by 375, with at least 50 engaged in testing. With 115 operating positions, every 10th station is for inspection and assembly correction. To insure adequate testing facilities, the company has installed 27 six-foot-high racks of color signal generating equipment and 3 miles of closed-circuit distribution equipment.

Westinghouse engineering and production experience points up the cost and complexity of assembling color television receivers. While a typical black and white set has about 700 parts and takes about 5½ hours for assembly and testing, a color receiver has nearly 1700 parts and requires more than 16½ hours for assembly and

Many hundreds of hand operations . . .

Color TV set, right, contains over twice as many parts as 17-inch image black-and-white set, left, but produces a smaller image on its costly color tube

testing. Testing time alone in color receiver production is over four times longer.

Price Will Go Down—As improved components and methods are developed, they are immediately incorporated in the color receivers in a continuing effort to reduce costs while maintaining high quality. When manufacturing economies are realized in the tube, chassis and other assembly, the price spread between color and monochrome will be narrowed, but the best most engineers expect is a cost differential of about 1½.

Tube replacement will also be a problem because, barring unforeseen major developments, even with mass-production economy a 21-inch color picture tube is likely to cost at least $125. And the life of a color picture tube today is a question mark.

Through 1954 and probably much longer color television from a programming and studio standpoint will continue in a period of experimentation. Major broadcasting systems now are telecasting only one or two shows weekly in color.

RCA Color Output Beginning

Radio Corp. of America expects this week to be in commercial production of color television receivers.

The unit which will have a viewing screen of about 12½ inches will retail for $1000. Production of RCA color picture tubes has reached a rate of 2000 a month.

Long hours for assembly and testing run costs of color TV receivers up

Unresolved Labor Ills

Harvard's Slichter urges more regulation of welfare funds, clearer state-federal boundaries

HOW WILL management meet increased labor costs? What should be done about industrial relations in public policy and law?

These were some of the unsettled industrial relations issues discussed by Sumner H. Slichter, Harvard University economist, at the annual meeting of the Associated Industries of Cleveland.

A New Age — Industry's entering the research age, Professor Slichter states, and small and medium companies must learn how to do research or get it done outside to help keep labor costs down.

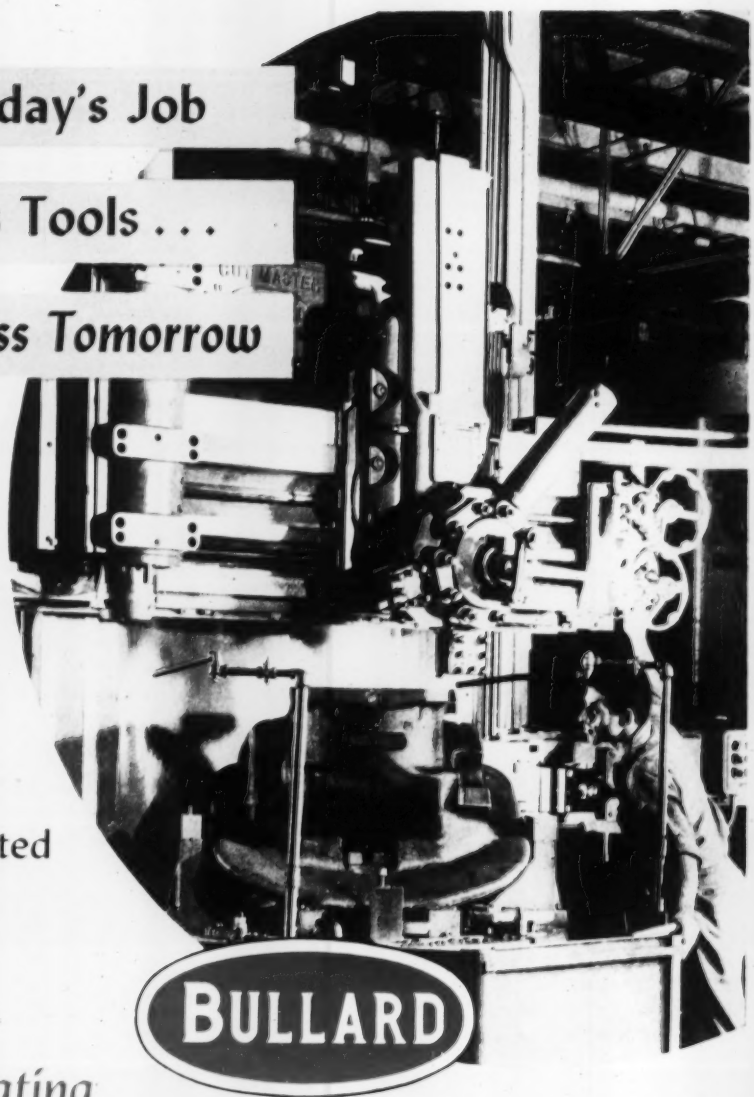
Some companies may gain help in controlling costs, however, from systematic union-management collaboration. Many unions are willing to help promote efficiency when they realize that jobs of their members are at stake.

Lines in Law — Respective authorities of the state and federal government jurisdiction need to be defined, Professor Slichter believes. Taft-Hartley Act interpretations give federal government jurisdiction over most matters where interstate or foreign commerce is affected, and it severely curtails the authority of states to deal with disputes which create local emergencies. According to Professor Slichter, the line of demarcation should be in terms of competitive areas. Industries not engaged in interstate competition should be under state jurisdiction, and those in interstate competition should be under federal jurisdiction.

Union welfare funds should be regulated just as carefully as are life insurance companies, Professor Slichter emphasizes. He points out that T-H regulations requiring employer participation in fund administration have not prevented abuses. His proposed regulations would include complete disclosure of income and expenses and periodic public audits of funds.

Upturn Ahead — The economist predicted an upturn in the economy by summer which will strengthen the unions' bargaining powers.

You Can't Do Today's Job With Yesterday's Tools . . . And Be In Business Tomorrow



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and new cutting
tools have out-dated
many machine
tools still in use

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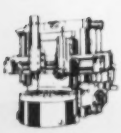
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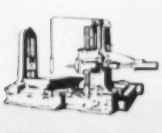
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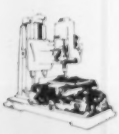
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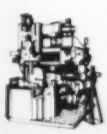
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DETROIT

IS THE NEW BUICK windshield cracked up to be just that?

Probably you've heard the story that reached such proportions Harlow Curtice himself denied the allegation. It seems there was this friend of a friend. Well, friend buys new Buick, gets flat tire, jacks up car, discovers windshield is cracked. Friend goes back to dealer, protests, dealer laughs, jacks up every car on floor and every windshield cracks. Well, police are guarding the General Motors Building, etc. etc.

No Goggles—Needless to say, Buick is not giving goggles with every new car just in case. On the other hand, neither is the company offering a new Buick free to every man who comes up with a cracked windshield. Being made of glass which is tempered and can vary in quality, windshields occasionally contain stresses which can lead to cracks in any car. For that reason Buick stands ready to replace defective windshields just as it always has. But reports on the number of replacements are substantially lower this year than when the former curved windshield was introduced sans rumors.

Where does a rumor like this come from? Buick would like to know and understandably wonders about the competition. Certainly it is signficant that the rumor does not apply to Cadillac and Oldsmobile which share bodies with Buick but happen not to be so great a market threat. It is significant, too, that the rumor spread over the whole country almost overnight. Within a single week STEEL correspondents picked up the story in Chicago, Cleveland, Detroit and New York.

Expedient?—On the other hand, the competition will be having wrap-around windshields themselves next year and generating prejudice against the design seems a questionable expedient. But rumors have been started in the past by competitors. Most striking example is an advertisement which ran around the turn of the century explaining that "one cylinder gives half the trouble of two." Usually, however, rumors are created by fertile minds fired by pride of ownership or, conversely, sour grapes.

Ford Gave a Push—In the early days, Ford Motor Co. often encouraged rumors about its products. One of the best concerns a man whose barn was destroyed in a tornado and with it his model T Ford. He called a wrecking company. By mistake it shipped the metal roof, which had been rolled into a ball, back to the Ford factory. Within a few days he received a letter reading, "Your car is unquestionably in bad shape, but we expect to have it repaired shortly."

Later rumors concerning Ford reported that if you could find pennies with mint marks spelling Ford the company would send you a new car or that if you saved 20,000 red cellophane cigaret tabs ditto. Not so innocent were rumors when the V-8 was introduced by the firm in 1932 that a V-8 block would split right down the middle since it was actually "two 4's". Other rumors reported that you couldn't keep oil in a V-8 and that the engine was so powerful it twisted drive shafts.

Just Gas — Then there's the story about the man who got a new car and went back to the dealer delighted with the fact that he was getting 60 miles per gallon. The dealer exclaimed, "The factory has been wondering what happened to that car. We'll have to take it back and put a regular carburetor on it." This is a variation of the rumors about conspiracy among the petroleum companies to keep mileage down, including everything from carburetor gadgets being bought up to special pills that make water burn being destroyed.

Other rumors pertain to the manufacture of cars. Rumors from time to time come up reporting that a company is cutting down on costs or is short on labor so it is only putting in every other bolt. Another legend pertains to a Buick with three portholes on one side and four on the other. Aluminum bodies used back in the twenties were rumored to stretch and become too big for the chassis, and all steel bodies were reported to crumple dangerously compared with solid wood.

Partially True — Incidentally, this has recently been said of modern bumpers compared with the prewar product and to a certain extent is true. Today bumpers are put on a car to protect against normal bumps in parking, but are intended to crumple un-

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,821	628,017
March		752,474
April		782,453
May		685,390
June		713,206
July		757,595
August		641,152
September		605,228
October		651,153
November		457,852
December		529,588
Total		7,818,108

Week Ended	1954	1953
Feb. 13	142,097	147,103
Feb. 20	148,257	161,860
Feb. 27	145,980	167,779
Mar. 6	139,263	158,825
Mar. 13	142,468	165,762
Mar. 20	143,000*	169,923

Source: Ward's Automotive Reports
*Estimated by STEEL.

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NASH METROPOLITAN
. . . a rumor finally materialized

der severe impact, according to the Automobile Manufacturers Association. This acts as a cushion which improves your chances of living to pay the higher repair bill involved. So the rumor that "thin bumpers are cheaper" is only a partial truth.

Other rumors have resulted in constructive effort. Back in the earlier days it was reported that battery ignition caused knock as opposed to magneto ignition which did not. In attempting to disprove this rumor, it is said that Boss Kettering got interested in what actually did cause knock. That resulted in the development of tetraethyl lead. Other partially justified criticisms of hydraulic brakes probably helped stimulate improvement in their reliability.

Head On — But by and large rumors are only a headache to the auto companies. Often the best course is to ignore them and avoid giving them wider circulation than they would otherwise receive. But when a rumor reaches the proportions of the Buick windshield story, the only answer is to meet it head on with the facts.

Rumors have always tended to follow innovation and for that reason plastics are now starting to feel the lash. Recently a story went the rounds that a Chevrolet Corvette had pulled up to a traffic light when suddenly it just crumbled into dust. A fence was hurriedly erected around the car to keep the crowds back out of danger and then a truck came and the car was shoveled into it and taken back to be analyzed.

That one will probably set a pattern in the years ahead, but here's a new one that we literally get a charge out of. It seems this guy had a friend who bought one of those new Ford Skyliners with a plastic roof panel. Well, he decided to have plastic seat covers put on the car and now his hair stands on end when he drives.

Shocking, eh?

At Last, Nash Metropolitan

Speaking of rumors, one finally materialized this week. After 11 years of research and planning under the names NXI and NIK, hardtop and convertible Nash Metropolitan models finally were introduced this week. Selling at $1445 and $1469 respectively, the cars feature an Austin A-40 engine and an 85-inch wheelbase. Bodies are produced by Fisher and Ludlow Ltd. with car assembly at Austin Motor Co. Ltd. Both are divisions of British Motors Corp., largest automobile manufacturing combine in Europe, says Nash which imports the cars.

The cars will seat two comfortably in the front with room for a brace of kids in the back. Gasoline consumption is reported to be up to 40 miles per gallon with top speed in excess of 70 mph. Continental rear tire carrier, directional signals, cigarette lighter, leather and nylon upholstery and foam rubber cushions are standard appointments.

Originally shown in a series of "surview" showings across the country in 1950, the NXI was literally designed by the American public, says Nash. The car is not designed as a substitute for the family car but is intended to supplement it.

New Studebaker Trucks

New styling, new cab and chassis features, and a V-8 power plant for the heavier-duty vehicles are announced by Studebaker Corp. in 1954 trucks. Ranging from a half-ton pickup to heavy-duty 2-ton units, the series includes five basic models. Studebaker's 1½ and 2-ton trucks are now available with either V-8 or 6-cylinder engines, and officials point out that 90 per cent of all trucking needs fall within the capacities represented by the company's new models.

STUDEBAKER'S NEW TRUCK
. . . underslung rear springs lower loading height

COPPERWELD STEEL COMPANY
WARREN, OHIO

ARISTOLOY STEELS

INTERIOR CORRESPONDENCE

DATE March 3, 1954

TO W. J. Buechling
Chief Metallurgist

FROM E. W. Husemann
Assistant Chief Metallurgist

SUBJECT Steel Alloy Leaded

Dear Bill:

Here is another report on the comparative machining qualities of leaded alloy and carbon steel. The story bears out the excellent results experienced by another manufacturer--faster machining--longer tool life--superior finish. One special advantage for automatic screw machine production, however, highlighted in the tabulation below, is the limited number of regrinds--even on the cutoff operation.

Material - 4150 Leaded Alloy 1-7/16" Rd.
Spindle Speed 435 RPM

Cycle - 102 Sec.
Part - 12 Pt. Socket
Total pieces run - 750

Tool	Feed Rev.	1st Regrind	2nd Regrind	3rd Grind	4th Grind	5th Grind	6th Grind	Total Regrind
Form Tool	.0016"	450 pcs						1 ✓
Comb Drill	.008"							0 ✓
3/4" Drill	.006"							0 ✓
Recessing Tool	.002"							0 ✓
Counter Bore	.012"							0 ✓
Knurling Tool	.006"							0 ✓
Cutoff Tool	.0024"	450	220					2 ✓

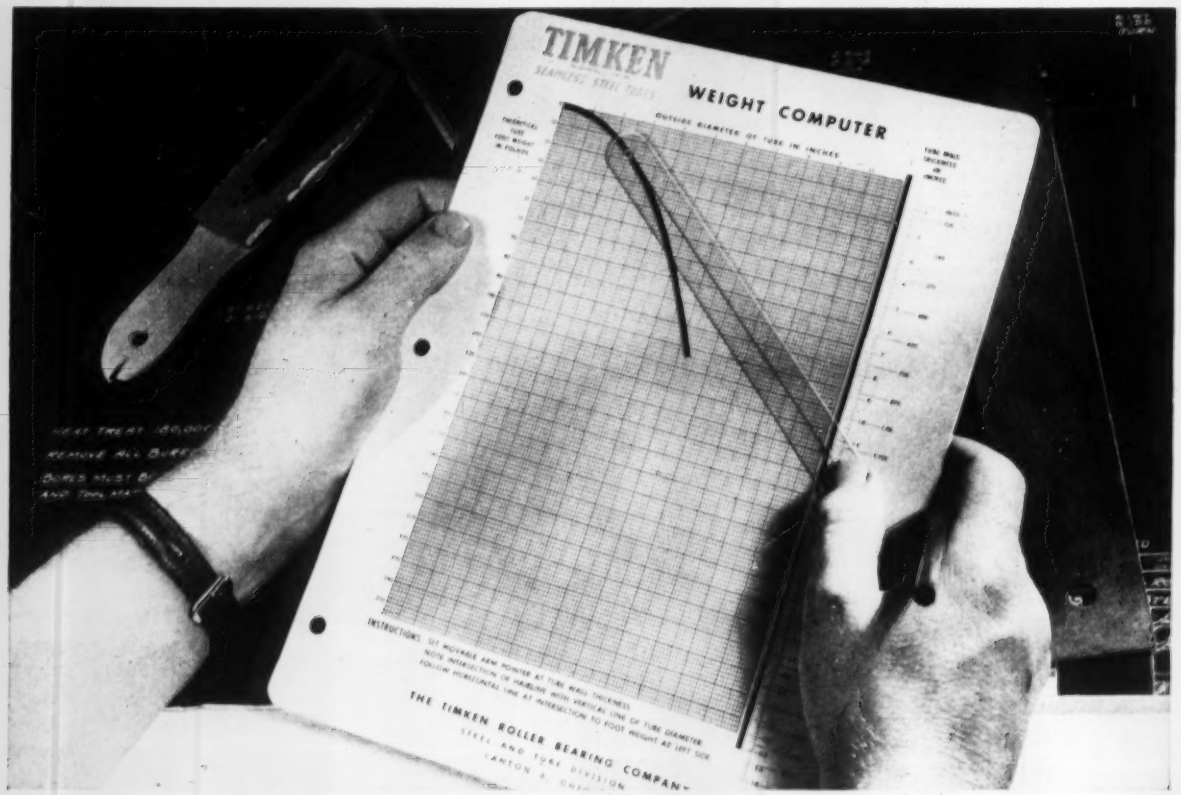
Material AISI 4150 1-7/16" Rd.
Spindle Speed - 290 RPM

Cycle - 142 Sec.
Part - 12 Pt. Socket
Total pieces run - 1000

Tool	Feed Rev.	1st Regrind	2nd Regrind	3rd Grind	4th Grind	5th Grind	6th Grind	Total Regrind
Form Tool	.0016"	190 pcs	320 pc	200 pc				3
Comb Drill	.008"	250	90	400				3
3/4" Drill	.006"	40	210	324	300			4
Recessing Tool	.002"	83*	(*Tool Slipped in Holder)					1
Counter Bore	.012"							0
Knurling Tool	.006"							0
Cutoff Tool	.0024"	40	169	200	70	107	200	6

It is important to note that mechanical properties, yield, tensile, and ductility, more than met specifications.

Ed



This free computer quickly figures the weight of steel tubing

WITH this handy little computer, you can quickly figure the weight of steel tubing. You set the slide at tube-wall thickness and O.D. and simply read off the tube weight per foot. Write us and we'll send you one. There's no obligation, of course.

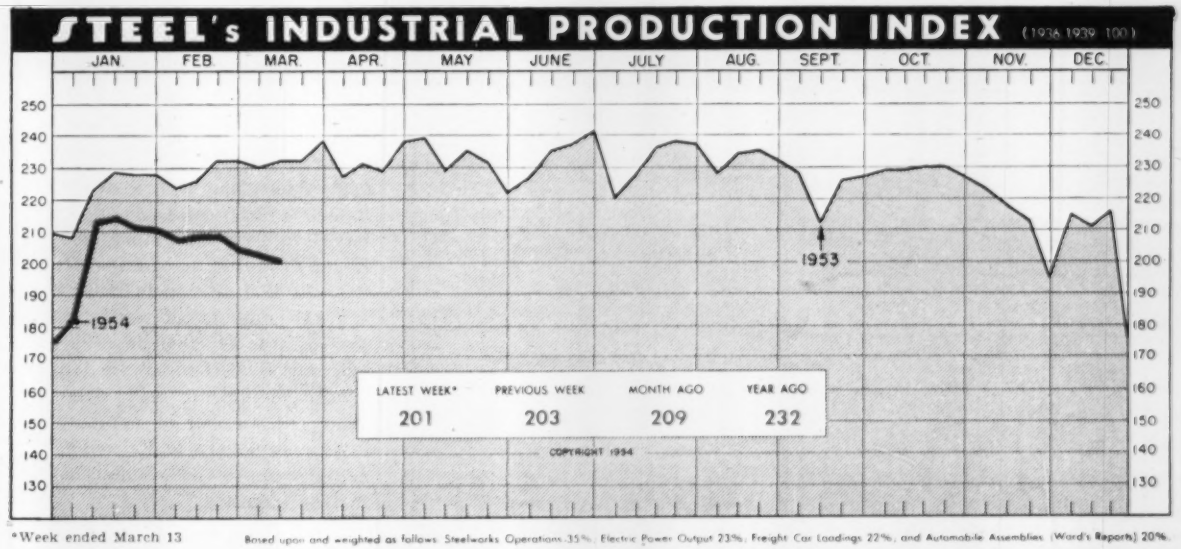
This computer is a small example of the helpful service the Timken Company offers manufacturers of hollow steel parts. Even more important: our engineers will be glad to study your problem and recommend the most economical tube size, *guaranteed* to clean up to your dimensions.

Many companies that formerly used bar stock for their hollow parts are making significant savings because they switched to Timken® seamless tubing. In addition to the big reduction in scrap loss, they save a great deal of machining time. Frequently, finish boring is the first production step. Machine tools are released for other jobs.

Timken seamless tubing has fine forged quality because it is made by a piercing process which is basically a forging operation. Write us now on your company letterhead for the handy tube weight computer. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended March 13

Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automobile Assemblies (Ward's Reports) 20%.

Current Production Dip Is Similar to That of '49

DON'T BE SURPRISED if the current production adjustment exceeds that of 1948-49. Now, production is responding to cuts in both military and civilian spending. Then, it was affected only by a cut in civilian expenditures.

Output Slide Continues . . .

Measured by the Federal Reserve Board's seasonally adjusted industrial production index, the current decline is already as deep as that of 1948-49 and it has occurred faster. In the seven months ended with February, output declined 10 per cent from the 1953 peak. A similar decline in 1948-49 was spread over nine months. Looking ahead, it appears that March output will slip below the February level of 123 per cent of the 1947-1949 average.

Behind the Slide . . .

This is revealed by STEEL's industrial production index, which continues to decline. The slip to 201 per cent of the 1936-1939 average in the latest week was due primarily to lagging railroad freight car loadings and steel production. The decline in freight car loadings pushed several railroads into an operating deficit during February. The drop in steel output has pulled the weekly operating rate down to approximately 68 per cent of capacity.

The over-the-year gain in electric output continues, with few exceptions, to dip week by week. Gain in the week ended Mar. 6 was 5.1 per cent, compared with around 15 per cent during last July. The slide is especially noticeable in the central industrial region. During the first week in March this area produced 3.4 per cent less electricity than it did a year ago, the Edison Electric Institute says.

Auto Outturn Excessive . . .

The situation in the automobile industry remains far from ideal. Though retail sales of new cars in February were 13 per cent above the January level, inventories continued to mount. This excess of production over sales caused stocks to rise 3 per cent above the record Jan. 31 level of 600,000 units, according to *Ward's Automotive Reports*.

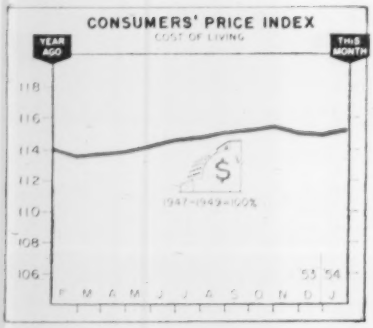
Paul G. Hoffman, chairman, and H. S. Vance, president, Studebaker Corp., point out that this continuing overproduction has resulted in an extension of price cutting to 1954 models. This situation, they feel, will be relieved only when dealers' stocks of 1953 cars are disposed of and when all car makers have adjusted their factory production to the level of what their dealers can sell profitably.

Suppliers' Plight . . .

Present overproduction in the automotive industry has struck a severe blow at the independents. The same goes for their suppliers. Their production for the independents has either failed to increase or has declined. Moreover, they have been forced to sit by while the integrated concerns expanded production in similar facilities.

An Economic Sign . . .

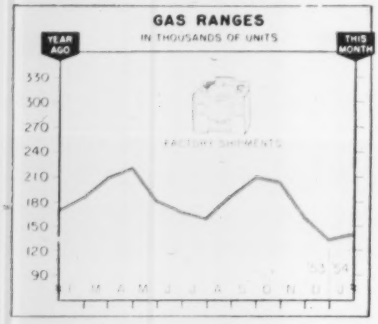
The independents, however, may take some comfort in the belief that low-priced cars will take a larger share of the new car market this year. But the manifestation of this belief by the "big three" so



Consumers' Price Index
(1947-1949=100)

	1954	1953	1952
Jan.	115.2	113.9	113.1
Feb.		113.4	112.4
Mar.		113.6	112.4
Apr.		113.7	112.9
May		114.0	113.0
June		114.5	113.4
July		114.7	114.1
Aug.		115.0	114.3
Sept.		115.2	114.1
Oct.		115.4	114.2
Nov.		115.0	114.3
Dec.		114.9	114.1

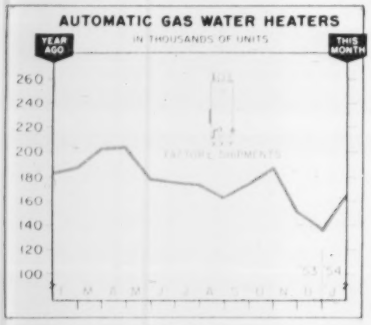
U. S. Bureau of Labor Statistics



Gas Ranges
Shipments in Units

	1954	1953	1952
Jan.	138,600	169,200	166,100
Feb.		185,900	166,200
Mar.		208,200	185,200
Apr.		220,300	182,300
May		181,000	162,800
June		166,600	175,700
July		159,000	154,200
Aug.		186,800	178,600
Sept.		209,500	199,600
Oct.		203,900	239,700
Nov.		158,500	186,400
Dec.		132,400	178,600
Total		2,181,300	2,175,400

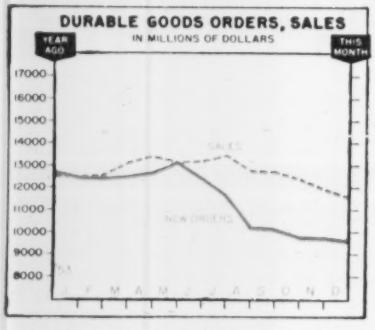
Gas Appliance Mfrs. Assn.



Automatic Gas Water Heaters
Shipments in Units

	1954	1953	1952
Jan.	167,200	184,000	148,700
Feb.		188,500	145,800
Mar.		203,000	153,300
Apr.		204,400	153,300
May		179,000	155,300
June		175,800	159,000
July		173,800	131,300
Aug.		163,000	161,500
Sept.		175,300	171,200
Oct.		189,200	185,300
Nov.		151,900	167,100
Dec.		137,800	178,600
Total		2,125,700	1,910,400

Gas Appliance Mfrs. Assn.



Durable Goods Orders, Sales
In Million of Dollars*

	New Orders		Sales	
	1953	1952	1953	1952
Jan.	12,454	11,142	12,508	10,861
Feb.	12,415	11,519	12,666	11,352
Mar.	12,520	12,171	13,116	10,632
Apr.	12,702	12,443	13,398	11,310
May	13,101	10,956	13,148	11,328
June	12,392	13,138	13,166	10,060
July	11,600	11,140	13,410	9,777
Aug.	10,139	9,998	12,730	10,437
Sept.	10,110	12,328	12,698	11,510
Oct.	9,677	11,452	12,376	11,968
Nov.	9,631	11,441	11,867	11,676
Dec.	9,543	12,011	11,567	11,913

*Seasonally adjusted. U. S. Bureau of Business Economics

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Feb. 22	Gray Iron Castings	Mar. 15	Ranges, Elec.	Jan. 8
Employ., Metalwk.	Feb. 22	Indus. Production	Feb. 15	Refrigerators	Jan. 8
Employ., Steel	Mar. 8	Ironers	Feb. 15	Steel Castings	Mar. 15
Fab. Struc. Steel	Mar. 1	Machine Tools	Mar. 8	Steel Forgings	Mar. 8
Foundry Equip.	Mar. 1	Malleable Castings	Mar. 15	Steel Shipments	Jan. 11
Freight Cars	Feb. 22	Prices, Wholesale	Mar. 1	Vacuum Cleaners	Mar. 8
Furnaces, Indus.	Jan. 8	Pumps	Mar. 15	Wages, Metalwk.	Mar. 1
Gears	Feb. 15	Radio, TV	Feb. 22	Washers	Feb. 15

far works in the opposite direction. The latest figures show that during January deliveries of Chevrolets, Fords and Plymouths increased to 58 per cent of total industry output.

Employment Calculations . . .

The recent re-employment that has taken place in the automotive industry does not show up in the latest figures for employment issued by the Bureau of Labor Statistics. At 47.5 million in mid-February the number of nonfarm employees was 900,000 below a year ago and 300,000 under the January level. Though it may seem unusual the number of nonmanufacturing employees in February was actually above the previous record for the month.

Checking the Fall . . .

The decline, of course, centers in manufacturing, which is 986,000 under the year-ago level. But even this slide seems to be slowing up. The reduction of 150,000 between January and February was the smallest decrease for any month since last autumn. And though about equal to the postwar low, the factory work week average of 39.5 hours in February was virtually unchanged from the previous month.

Extent of Inventory Cut . . .

With employment and production reduced the spotlight is on inventories. On a seasonally adjusted basis, business inventories totaled $80.7 billion in January, the Office of Business Economics reports. In four months a cut of $1.3 billion has been made. This compares with a cut of $1.9 billion during the corresponding period in 1948-49.

Retail Demand Dips . . .

The current inventory cut is hampered by lagging retail sales. Estimated sales in January of $12.4 billion were 5 per cent under the year-ago level, the Department of Commerce says. In the latest week department store sales were 11 per cent under a year ago. A decline from the levels of a year ago this time would be expected.

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,642	1,686	2,284
Electric Power Distributed (million kwhr)	8,519	8,586	8,138
Bitum. Coal Output (daily av.—1000 tons)	1,053	1,126	1,370
Petroleum Production (daily av.—1000 bbls)	6,440[1]	6,433	6,450
Construction Volume (ENR—millions)	$245.5	$208.1	$273.7
Automobile, Truck Output (Ward's—units)	142,468	139,263	165,762
TRADE			
Freight Car Loadings (unit—1000 cars)	587[1]	591	700
Business Failures (Dun & Bradstreet, no.)	229	223	165
Currency in Circulation (millions)[3]	$29,870	$29,885	$29,780
Dept. Store Sales (changes from year ago)[3]	−11%	−3%	+11%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$16,960	$19,562	$16,551
Federal Gross Debt (billions)	$274.7	$274.8	$267.5
Bond Volume, NYSE (millions)	$18.2	$18.5	$17.1
Stocks Sales, NYSE (thousands of shares)	9,197	10,141	8,537
Loans and Investments (billions)[4]	$79.5	$79.7	$77.5
U. S. Gov't Obligations Held (billions)[4]	$32.3	$32.5	$31.3
PRICES			
STEEL's Finished Steel Price Index[5]	189.74	189.74	181.31
STEEL's Nonferrous Metal Price Index[6]	206.7	202.6	225.1
All Commodities[7]	110.6	110.7	110.0
Commodities Other Than Farm & Foods[7]	114.3	114.3	113.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549; 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

That's because of the surge that occurred then. But a decline of this extent puts the latest department store sales under the 1952 level.

New Construction Records . . .

The record February construction has been confirmed by the F. W. Dodge Corp. It says that construction contracts awarded in the 37 states east of the Rockies amounted to $1,221,260,000 during the month. This total was 7 per cent above the previous February high, which was set in 1951. It was also the most important part of a new record for January-February construction — a record that was 9 per cent higher than the previous high reached in 1951.

More Space Wanted . . .

One of the most important factors in the February construction level was the over-the-year increase in commercial construction. The trend, expected to continue, should raise spending for this purpose 10 per cent above last year's peak of $2.2 billion, the U. S. Chamber of Commerce reports. One of the larger contributors to the trend is the J. C. Penney Co. Its expansion program this year calls for the addition of 30 to 40 stores.

Young Presidents Say . . .

Hoping to achieve better things also are the members of the Young President's Organization. In answer to a questionnaire 60 per cent of them said their firms would make gains this year. At the same time only 18 per cent saw improvement for their industries as a whole. And only 7 per cent thought general business conditions would improve.

Trends Fore and Aft . . .

Harlow Curtice, General Motors' president, says that his concern's appliance business is substantially better so far this year than during the same period last year . . . Retail sales of 731,917 television sets in January set a record for the month, the Radio-Electronics-Television Manufacturers Association reports . . . New orders for foundry equipment during January were indexed at 173.8 per cent of the 1947-1949 average by the Foundry Equipment Manufacturers Association. Orders at this level were 74.2 percentage points above the January, 1953, figure and 13 percentage points above December.

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Chrome Alloy and Stainless

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FINEST ELECTRIC FURNACE STEEL
HEAT TREATMENT
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These factors combine to make the finest steel balls obtainable because they contribute to closer surface uniformity — better strain distribution — higher load carrying capacity — longer life.

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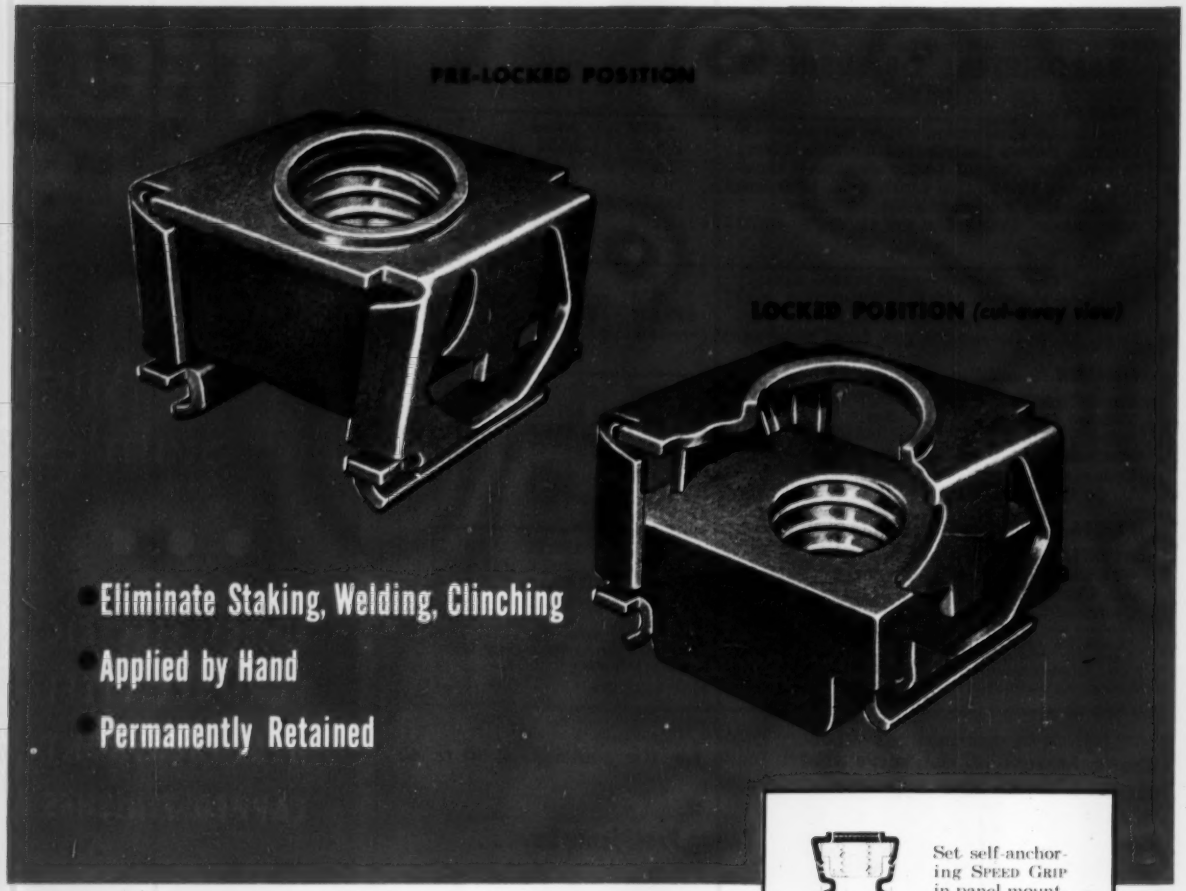

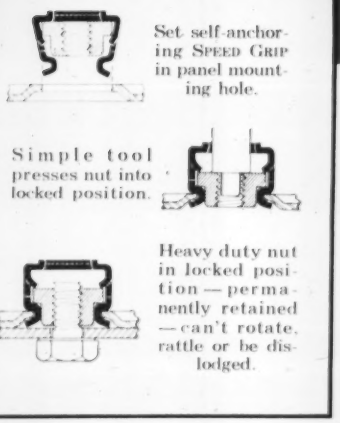
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Simple tool presses nut into locked position.
Heavy duty nut in locked position — permanently retained — can't rotate, rattle or be dislodged.

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cuts assembly costs in half!

Whatever your present method of attaching square nuts to panels, new self-anchoring SPEED GRIPS can do the job faster, easier, better. This unique fastener has spring steel "mechanical hands" that permanently lock the nut in bolt-receiving position. It cannot be dislodged even with rough handling. Applied after painting or porcelainizing, there is no clogging, retapping or masking of threads to bother about. *And* it is ideal for blind location attachments.

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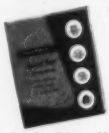

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TINNERMAN *Speed Nuts*®

MORE THAN 8000 SHAPES AND SIZES

FRANCIS H. DAVIDSON
. . . v. p. at Igoe Bros. and subsidiary

EDWARD H. FARMER
. . . joins Bliss Co.'s Calif. Works

JAMES K. WATKINS
. . . chief engineer of Crucible works

Igoe Bros. Inc., Newark, N. J., appointed **Francis H. Davidson** vice president. He also was made vice president of the subsidiary, Taylor-Davis Inc., Philadelphia. Mr. Davidson joined Igoe in 1952 as manager, reinforcing steel division. Prior to that time he was with Jones & Laughlin Steel Corp.

Lee C. Sassmanhausen was named works manager of **Mullins Mfg. Corp.'s** Liberty plant at Warren, O., to succeed **C. L. Fix.** Named assistant works manager is **Earl L. Scott,** former head of the production planning department. **Ralph Knepper** replaces Mr. Scott. Mr. Sassmanhausen, who has operated his own tool and die shop in Detroit since 1945, formerly served Chrysler Corp. for many years.

Edgewater Steel Co., Oakmont, Pa., elected **D. W. McGeorge** vice president-sales, **Walter M. Cree** general sales manager, **W. O. Fleming** manager of industrial sales and **R. G. Snively** assistant manager of industrial sales. **W. G. Heiner Jr.** becomes manager of railroad sales and **V. P. Jakovac** assistant manager.

R. F. Allen was appointed assistant to the executive vice president, **H. K. Porter Co. Inc.**, Pittsburgh. He most recently was president of Stansteel Corp.

Edward H. Farmer was appointed plant manager of **E. W. Bliss Co.'s** recently acquired San Jose, Calif., works. He has been associated with Lockheed Aircraft Corp. for the last 12 years, most recently as works manager.

Wickwire Bros. Inc., Cortland, N. Y., appointed **Charles G. Wickwire Jr.** to vice president-sales, **Harold W. Ballous** and **Willard F. Potter** assistant sales managers, and **Winthrop R. Wickwire** assistant sales manager for manufacturers' wire.

Cary C. Wilson was elected vice president-sales, **Pheoll Mfg. Co.**, Chicago. Formerly with Cinch Mfg. Corp., subsidiary of United-Carr Fastener Corp., he served as vice president and general manager before joining Pheoll in January.

A. S. Kromer was elected a vice president, **Calumet & Hecla Inc.**, Chicago. He will also be general manager of the firm's Calumet Division with headquarters in Calumet, Mich., where he succeeds **Orson A. Rockwell,** who resigned to join Eagle-Picher Co.

Douglas Aircraft Co., El Segundo, Calif., appointed **John W. Roda** superintendent of manufacturing and **A. C. Miller** assistant superintendent of production control manufacturing.

Crucible Steel Co. of America, Pittsburgh, appointed **James K. Watkins** chief engineer of its Midland, Pa., Works. He succeeds **John Ferm,** retired. Mr. Watkins joins Crucible after serving since 1944 as chief engineer for Pittsburgh Steel Co.'s Monessen Works.

Zurbach Steel Corp., Southington, Conn., elected **Robert K. Story** vice president and general manager of its Connecticut division. Since April, 1953, he has been general manager of the firm's steel warehouse in Southington. Prior to 1951 when he joined Zurbach, Mr. Story was with the sales organization of United States Steel Corp.

A. H. McChesney, superintendent of **Studebaker Corp.'s** jet engine division and formerly chief metallurgist in that division, was made chief inspector for all Studebaker manufacturing operations. He succeeds **R. H. Nickerson,** retired.

John P. Zur was appointed executive vice president and a director of **Trauwood Engineering Co.**, Cleveland. He was chief engineer for Trauwood during the period of 1936 to 1951. For the next three years he served Lee Wilson Contracting Co., Cleveland, as production manager.

Rear Adm. J. A. Briggs, U. S. Navy, ret., joined **Yardney Elec-**

HERBERT BARCHOFF
. . heads Eastern Brass & Copper

EUGENE C. CLARKE JR.
. . promoted at Chambersburg Engineering

GEORGE E. O'BRIEN
factory mgr. at Rockwell plant

tric Corp., New York, to serve as special assistant to the president.

Herbert Barchoff is now president of **Eastern Brass & Copper Co.**, New York. With the firm since 1938, he served most recently as executive vice president. The retiring president, **Abraham Barchoff**, becomes chairman of the board.

Sharon Steel Corp.'s **Brainard Steel Division**, Warren, O., appointed **George A. Kuhn** manager of sales, building products division. Prior to joining Brainard he was zone manager for F. C. Russell Co.

A. T. Forrest was made chief engineer for the Park Works and Spring Works of **Crucible Steel Co. of America**, Pittsburgh.

Warren Dudley was promoted to chief midwest regional field engineer by **Virginia Metal Products Inc.**, with headquarters in Detroit.

Harry B. Budd is now sales manager, eastern division, **Flxible Co.**, Loudonville, O.

At **Chambersburg Engineering Co.**, Chambersburg, Pa., **Eugene C. Clarke Jr.**, vice president, was advanced to general manager of the company and assumes the duties of general administration. Other management changes include **Kenneth W. Palmer**, advanced to vice president and continuing as treasurer; **C. Douglas Galloway III**, secretary, advanced to works manager; and **George H. Martin**, named foundry superintendent.

John F. Michael was appointed advertising manager and market analyst of **Cleveland Hardware & Forging Co.**, Cleveland. He formerly served as management engineer at Lincoln Electric Co.

George E. O'Brien, manager of purchasing and production for **Rockwell Mfg. Co.'s** National Meter Division at Brooklyn, N. Y., for the last three years, was named factory manager of the firm's new water meter plant at Uniontown, Pa.

Waldes Kohinoor Inc., Long Island City, N. Y., named **Howard Roberts** a technical and sales representative for the Truarc Division. Formerly supervisor of Truarc production planning and control, he is succeeded by **Gustav C. Schroeder.**

Dogan H. Arthur was made assistant aircraft sales manager, **Aeroquip Corp.**, Jackson, Mich. **J. R. Roberts** was made advertising manager.

Robert A. Hughes, formerly with Guy F. Atkinson Co., was appointed sales manager, **Williamette Iron & Steel Co.**, Portland, Oreg.

Ben de Cillia succeeds **James B. Dodge**, retired, as sales manager, **Northwest Bolt & Nut Co.**, Seattle.

Guy J. Bates was made manager of General Motors Corp.'s **Fisher Body** plant in Cleveland. He succeeds **E. J. Gleason**, retired. **Rolland F. Smith** assumes Mr. Bates' former post as assistant manager of the plant.

Thomas A. Kelly, manager of **Rheem Mfg. Co.'s** Philadelphia plant, was transferred to the firm's corporate headquarters in Richmond, Calif., as manager of manufacturing planning.

Herbert F. Middleton was transferred to Los Angeles as western area manager for **Acme Steel Products Division**, Acme Steel Co. He is replaced by **William H. Smythe Jr.** as San Francisco district sales manager.

Edward L. Soule Jr., vice president-general manager, **Soule Steel Co.**, San Francisco, was elected president to succeed his father, **Edward L. Soule Sr.**, now chairman of the board.

Ernest W. Nelson was made manager, chemical equipment sales department, **Pfaudler Co.**, Rochester, N. Y.

J. G. Squibb was made general manager of the Beech Bottom Works, **Wheeling Steel Corp.**, Wheeling, W. Va., to succeed **J. M. Felton**, retired. **R. E. Bevington** was elevated to assistant general manager, Mr. Squibb's former post.

George L. Duke was named manager of purchases for the aviation gas turbine division of **Westinghouse Electric Corp.**, South Phil-

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OMAR V. GREENE
. . . gen. sales mgr. at Carpenter Steel

ROBERT W. KNAUFT
. . . Chas. Taylor Sons president

HARRY S. CLARK
. . . LeTourneau plant manager

adelphia, Pa. He formerly served as purchasing agent for the firm's small motor division at Lima, O.

Omar V. Greene was appointed general sales manager and **John W. Thompson** sales development manager for **Carpenter Steel Co.**, Reading, Pa. Both appointments are effective Apr. 1. Mr. Green was formerly New England manager with headquarters in Hartford, Conn. Mr. Thompson was product manager at Carpenter's home office.

Herbert Boshea was made purchasing agent for **Bridgeport Thermostat Division,** Robertshaw-Fulton Controls Co., Bridgeport, Conn.

Norman H. Callner assumes the newly created position of chief project engineer, compressed gas division, **Liquid Carbonic Corp.**, with headquarters in Chicago.

New officers of **Chas. Taylor Sons Co.**, Cincinnati, subsidiary of National Lead Co., include: **Robert W. Knauft,** president; **M. C. Booze,** vice president; **L. J. Woodcock,** treasurer; and **J. B. Henrich,** secretary.

Eric B. T. Kindquist, former wire mill superintendent and assistant works manager for Eastwood Nealley Corp., was appointed vice president-general manager, **Garfield Wire Division,** Overlakes Corp., at Garfield, N. J.

F. Norman Tracy was elected vice president-general manager, **Ward LaFrance Truck Corp.**, Elmira, N. Y.

Link-Belt Co. named **Donald E. Thal** central general manager of its Pacific division with headquarters at the San Francisco plant where he has been serving as sales manager.

Harry S. Clark was appointed general manager of the Longview, Tex., plant of **R. G. LeTourneau Inc.** In addition he retains the position of manufacturing manager which he has held since February, 1952. **Richard H. LeTourneau,** vice president in charge of production, formerly served as Longview plant manager.

Sidney Kelter joined **General Iron & Steel Co.**, St. Louis. He manages the scrap iron and steel brokerage department. Mr. Kelter has been manager of Hyman-Michaels Co.'s St. Louis office for the last seven years.

Aeroil Products Co. Inc., South Hackensack, N. J., appointed **John B. Foley** director of purchases.

Wisconsin Motor Corp., Milwaukee, appointed **Ray J. Fellows** sales manager and **J. W. Perschbacher** assistant sales manager.

OBITUARIES . . .

Arthur E. Nicholson Sr., chairman of **W. H. Nicholson & Co.**, Wilkes-Barre, Pa., died Mar. 2.

Albert Goldman, vice president and general manager, **Atlantic Mfg. Co.**, Philadelphia, died on Mar. 7.

Frederick G. Dawson, 61, executive assistant to the general manager, **Sikorsky Aircraft Division,** United Aircraft Corp., Bridgeport, Conn., died Mar. 8.

Walter C. Pijawka, 47, superintendent, electric melting, **Midvale Co.**, Philadelphia, died Mar. 5.

George E. Reminger, 69, Toledo, O., district manager, **Peninsular Steel Co.**, died Mar. 5.

Francis H. Brownell, 86, chairman of **American Smelting & Refining Co.**, New York, from 1930 until his retirement in 1947, died Mar. 8.

Robert E. Craig, 58, secretary-treasurer, **Phoenix Iron & Steel Co.**, Philadelphia, died Mar. 13.

Frederick U. Conrad, 63, since 1947 president of **Niles - Bement - Pond Co.**, West Hartford, Conn., died Mar. 15.

Howard Worrell, president and founder, **Lyons Iron Works,** Manchester, N. H., died Mar. 7.

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TRANSPORT

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Granite City Expands

Firm's ingot capacity and processing facilities are enlarged and improved

ALL MAJOR projects have been completed in the expansion program of Granite City Steel Co., Granite City, Ill., says Rust Engineering Co., Pittsburgh, the general constructor. Rust contracts totaled $50 million.

The program, started in 1951, increased the plant's annual ingot production capacity from 700,000 to 1.2 million ingot tons. It also resulted in improvement and expansion of facilities for processing the additional ingot tonnage into flat-rolled steel products.

New Facilities—The Rust firm constructed three open-hearth furnaces, a 46-in. blooming mill, three slab heating furnaces, and made alterations to the hot strip mill.

The three new open-hearth furnaces, each with a capacity of 300 tons per heat, are oil-fired and equipped with the latest automatic controls.

To serve the new 46-in. blooming mill, an ingot buggy, down-and-up crop shear, slab loading table with slab pushers and pilers in duplicate, and two slab transfer cars for removal of processed slabs were installed.

The new slab handling and slab storage building is designed so that slabs may be loaded and shipped as slabs or delivered to the slab-heating furnaces.

Slab Heaters—Rust also designed and erected the three new slab heaters in conjunction with a subsidiary, Rust Furnace Co. These slab heaters are of the continuous, zone-controlled, triple-fired, recuperative type. Each has a design capacity of 100 tons per hour and is equipped for firing with natural gas or fuel oil.

To replace an old 3-high reversing mill, a new 4-high reversing roughing mill was installed. Alterations and additions were made to facilities on the hot strip line constructed to send the strip to the finishing stands at a design speed of 1400 lineal fpm.

A new shear line was constructed in the new hot-rolled coil shearing and shipping building to process coils from the hot strip line. Installed in conjunction were an uncoiler, leveler and Halden shear.

A new roll maintenance building was constructed and equipped with two roll grinders and one roll lathe, with foundations provided for an additional grinder.

Ford Reschedules Operations

Ford Motor Co. of Canada, Ltd., Windsor, Ont., after Mar. 12 will concentrate the assembly of all Ford and Meteor passenger cars in its new Oakville, Ont., plant and will discontinue the production of these cars at Windsor. Assembly of Mercury and Monarch passenger cars and Ford and Mercury trucks will continue at Windsor until later in the year. The move is being made to hasten the conversion of the existing Windsor assembly plant into an engine plant that will be ready for large-scale production of engines by early fall, in time for the 1955 models.

Mueller's Transfer Sought

Net assests, name and goodwill of L. J. Mueller Furnace Co., Milwaukee, will be transferred to Worthington Corp., New York, subject to approval by Mueller stockholders. The Mueller plant and facilities would be operated as the Mueller Climatrol Division of Worthington. Mueller home heating equipment will continue to be manufactured at Milwaukee, while Worthington will continue to manufacture its air-conditioning equipment at Holyoke, Mass., and Decatur, Ala. Worthington also produces a wide range of machinery and equipment for industry, for public works and for the home.

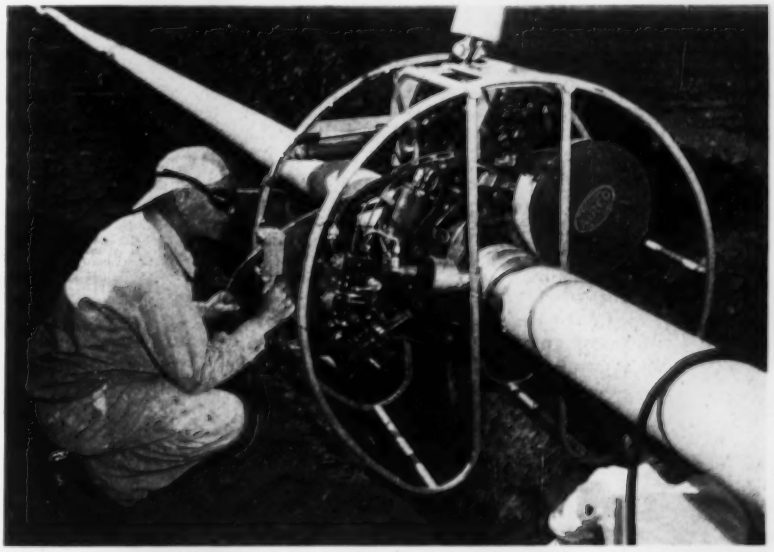
International Silver To Move

International Silver Co. will shift its manufacturing activities in Hamilton, Ont., to its plant in Niagara Falls, Ont., around Apr. 30. W. H. Perkins, president, says the company's head office in Hamilton also will be moved to Niagara Falls, coinciding with the factory changeover.

Crown Subsidiaries Merge

Crown Cork & Seal Co. Inc., Baltimore, has merged its wholly owned subsidiaries with the parent company. These subsidiaries were the Crown Can Co., Philadelphia; Western Crown Cork & Seal Corp., San Francisco; Crown Cork Spe-

(*Please Turn to Page* 73)



Portable Welder Makes Aluminum Pipelines Competitive

This new portable and automatic welding machine, which technicians of Reynolds Metals Co. say makes aluminum pipelines competitive with steel on cost, has been demonstrated during the laying of the first aluminum pipeline in Texas, a 12-mile high pressure link between White Point gas field and Reynolds' La Quinta plant near Corpus Christi. During the demonstration, welds were subjected to pressures as high as 1800 psi and did not break

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Definite results from a grinding wheel are something more than simply mixing proportions of abrasive grains, bonds and other materials. Experience has a lot to do with it — years at a grinding machine, in our laboratory, as an abrasive engineer or ceramic technician. These are the extras you get when you specify Sterling . . . the combined knowledge that speedily creates the tailor-made wheel for your job, and only your job!

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Jal-Tread floor plate combines the strength and durability of high quality steel in an exclusive checkerboard pattern scientifically designed for *safety*.

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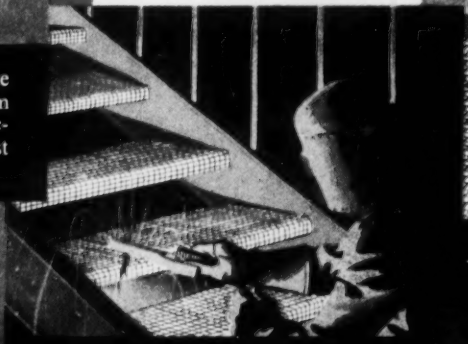
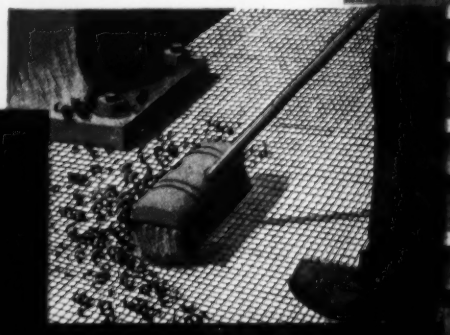
SAFE FOOTING—300 miniature squares per square foot—all of uniform height—provide maximum linear friction surface that protects you against lost time accidents.



EASY FABRICATION—Jal-Tread's straight line pattern simplifies welding, flanging, shearing, bending, punching, and drilling operations. Experience shows that Jal-Tread can be cold-formed on standard plate bending machines.



EASY CLEANING—Jal-Tread's straight line gutter pattern permits quick, thorough sweeping and draining in any direction.

ATTRACTIVE APPEARANCE—Jal-Tread's exclusive checkerboard pattern gives a distinctive, neat appearance in all its applications.

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Available at leading distributors everywhere

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J&L STEEL

(*Continued from Page 69*)

cialty Co. Inc., St. Louis; and Crown Cork & Seal Co. Inc., Detroit. Also the Crown Cork & Seal Co., a Baltimore selling agency, and an inactive firm, New Process Cork Co. Inc., were joined with the parent company. The merger is designed to create greater efficiency and lead to substantial economies in various areas, especially as they relate to federal and state taxes.

Contest Winners Named

Malleable Founders Society, Cleveland, announced the winners of its third annual self-improvement safety contest. The winner in Group I (less than 100 employees) is Webster Mfg. Inc., Tiffin, O.; in group II (100 to 199 employees), Chain Belt Co., Milwaukee; in Group III (200 to 399 employees), Texas Foundries Inc., Lufkin, Tex.; in Group IV (more than 400 employees), Terre Haute Malleable & Mfg. Corp., Terre Haute, Ind. Each of the winners reduced his accident frequency rate by at least 70 per cent. The accident frequency for the 60 plants participating in the contest was 21.7, a reduction of 27 per cent from the 1952 figure.

Raytheon May Build Laboratory

Tentative plans for construction of an electronics engineering and research laboratory in Wayland, Mass., were announced by C. F. Adams Jr., president, Raytheon Mfg. Co., Waltham, Mass.

Stanley Tool & Machine Formed

Stanley Tool & Machine Inc., Shrewsbury, Mass., has been incorporated to manufacture tools, dies, jigs and fixtures, as well as machines and motors. Incorporators are Stanley E. Chadwick, Richard A. Hubbard, Williard C. Hubbard and Stanley A. Plotczyk.

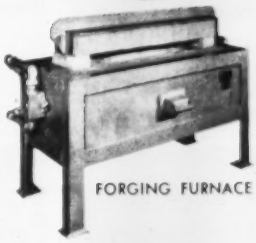
Metallizing Firm Expanding

Metallizing Engineering Co. Inc., Long Island City, N. Y., is constructing a plant at Westbury, Long Island. It is scheduled for completion next July. It will contain over 20,000 sq ft of office space in addition to 45,000 sq ft of manufacturing, storage and

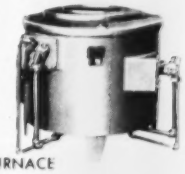
get the best out of your tool steel through

PROPER DRESSING

FORGING HAMMER



FORGING FURNACE



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Here is a "Package" that will get rid of a costly and annoying problem . . . In fact, it will save up to 60% of costs for cutting and chipping tools . . . the best life is gotten out of today's steels through proper dressing . . . proper steel; properly treated, will reduce costs substantially. Now, at your own convenience, you can dress as many tools as are needed, and keep close control of your tool inventory.

The complete "Tool Dressing Package", entirely engineered by LOBDELL UNITED CO., (subsidiary of United Engineering and Foundry Co.) . . . includes all of the Forging, Heat Treating and Dressing Equipment . . . plus, the practical methods needed . . . and this "Package" not only reduces inventory costs, but it can do this at *low initial* cost, recoverable nominally in one year . . . without special metallurgical control.

The "versatile" NAZEL Electro-Pneumatic Forging Hammer is the LOBDELL UNITED CO. product . . . For the additional equipment presented within this "Package", LOBDELL is joined by a group of the most reputable leaders in their fields:

Heating Equipment by Eclipse Fuel Engineering Company

Tool Grinding Equipment by Black and Decker Company

Accessory Tools and Tool Steels by Bedford Tool and Forge Company

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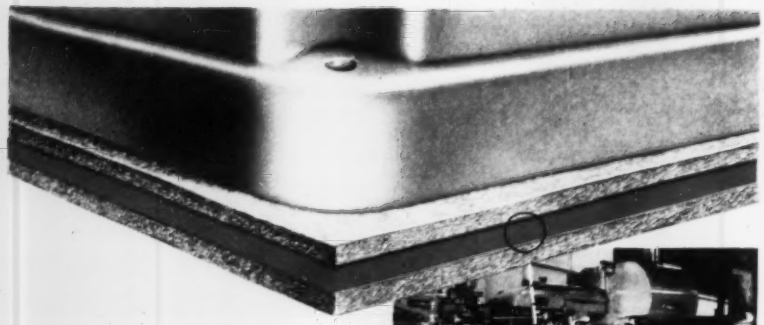

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VIBRATION
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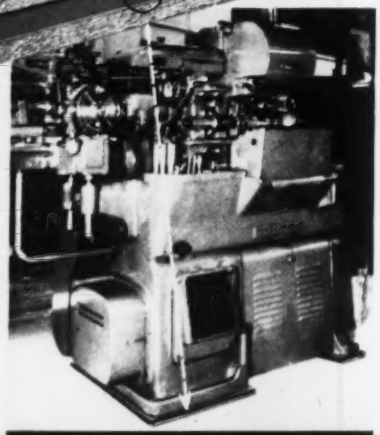
FLOOR DRILLING

by mounting your machinery on



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- Felters adhesive holds for keeps, yet permits re-positioning of machines. (Our UNISORB Booklet tells you how.)

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COMPANY .....
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shipping areas, all located on a single floor. The company will vacate the Long Island City plant, once the new facilities are ready. Metallizing Engineering has warehouse branches in Chicago and Los Angeles, sales offices in 26 cities of the United States and a manufacturing branch in England.

Industrial Truck Agent Moves

Knights Equipment Repair moved to 345 Blue Bonnet St., San Antonio, Tex. This firm is subagent for L. F. Chickering Co., Houston, franchise representative of Automatic Transportation Co., Chicago, manufacturer of electric-driven industrial trucks.

Clark Equipment To Build

Clark Equipment Co., Buchanan, Mich., manufacturer of industrial materials handling trucks, construction equipment and heavy automotive components, plans to erect a plant on the outskirts of Benton Harbor, Mich. The 145,000-sq-ft building, scheduled to be in operation before the end of this year, will be used as an assembly plant for a new line of tractor shovels to be produced by Clark and for the assembly of power shovels now made in the firm's present Benton Harbor plant.

Forms Canadian Subsidiary

William H. Frank, president, Bull Dog Electric Products Co., Detroit, announces the formation of a Canadian subsidiary, Dominion Bull Dog Ltd., Toronto, Ont. Robert R. Farrell is vice president and general manager of the Canadian subsidiary, and James E. Wilson is secretary-treasurer.

Porter To Buy Fire Brick Firm

H. K. Porter Co. Inc., Pittsburgh, plans to acquire the business of McLain Fire Brick Co., manufacturer of refractory fire brick, sleeves, nozzles, runners and hot tops for use in steel plants and metal refineries. McLain operates six plants in Pennsylvania and Ohio.

Operations will continue as the McLain Fire Brick Co., Division of H. K. Porter Co. Inc., under the direction of W. A. Turner, vice pres-

The Right Draw—

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You don't have to worry about getting the "right draw" when you bring your tubing problems to Summerill. We'll draw seamless tubing to *your* specifications.

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ident and general manager, says T. M. Evans, president of Porter. The acquisition is in line with Porter's policy of expansion and diversification.

Caland Orders Total $1.5 Million

Caland Ore Co. Ltd., Inland Steel Co.'s Canadian mining subsidiary, placed orders with Canadian manufacturers for more than $1.5 million of electrical equipment that will be used in developing its ore property near Atikokan, Ont. It is estimated that 160 million cu yd of silt must be removed from the bottom of Falls Bay in Steep Rock lake.

National Erie Corp. Moves

Business of National Erie Corp. has been transferred from 1521 Raspberry, Erie, Pa., to Bucyrus-Erie Co., 12th and Cranberry. Since purchase of practically all its capital stock by Bucyrus in 1951, National Erie had been operated as a subsidiary of the excavator manufacturer. The plant will now be known as the Raspberry Street plant of Bucyrus-Erie. Its facilities include a steel foundry with open-hearth and electric furnaces and a machine shop. For some time, its full capacity has been devoted to Bucyrus-Erie products, principally those manufactured at the company's plant on 12th street.

Bearingmaker Names Agents

Ahlberg Bearing Co., Chicago, appointed two additional distributors who will serve automotive parts jobbers and industrial and mill supply jobbers in California. F. Somers Peterson Co., San Francisco, will serve Northern California, and Latham Sales Co., Warehouse Division, Los Angeles, will serve Southern California.

Aerofin Corp. Leases Plant

Aerofin Corp., Syracuse, N. Y., leased the former United States Hoffman Machinery Corp. Plant 3 property in that city. Aerofin produces components for the air-conditioning industry and also has been engaged in defense production. The leased property has 67,000 sq ft of floor space.

Salem-Brosius Buys Firms

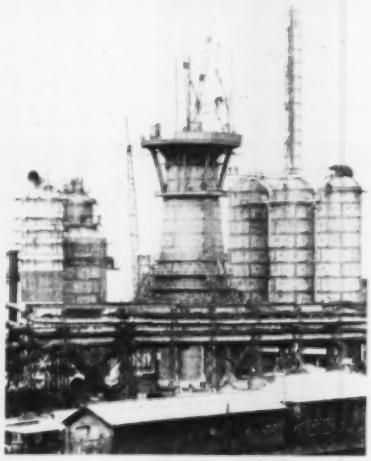
Salem-Brosius Inc., Pittsburgh, purchased all interests held by H. L. Hall, Toronto, Ont., in the H. L. Hall Corp. Ltd. and Holbeck Corp. Ltd., that city. These engineering firms deal in heating, heat treating and other types of industrial furnace equipment, as well as industrial processing equipment and machinery. They will be operated as a wholly owned subsidiary of Salem-Brosius.

Okonite Merges with Subsidiary

Okonite Co., Passaic, N. J., manufacturer of insulated wires and cables, will be merged, effective Apr. 1, with its wholly owned subsidiary, Okonite-Callender Cable Co. Inc., Paterson, N. J. The subsidiary makes paper-insulated power cables and splicing materials.

Sciaky Plans Research Plant

With a growth from $8 million to about $50 million since 1941, the resistance welding industry is still in its infancy. Sciaky Bros. Inc., Chicago, convinced that the industry's growth is hampered by lack of technical information, is planning to announce shortly opening of a research plant. Object of this program is: Fundamental research on resistance welding of all metals and eventually a thorough exploration of design considerations.



No Smog from This One

The most modern equipment for preventing air and water pollution is being built into this new blast furnace at Cleveland by Arthur G. McKee & Co. Unit is for American Steel & Wire Division, U.S. Steel Corp., and completion is set for early summer

Establishes New Division

Consolidated Engineering Corp., Pasadena, Calif., established a Systems Design & Development Division within its engineering department. This division will design and deliver complete systems of information processing units coupled with special controls and associated input-output equipment. Kennett W. Patrick will direct the division.

Day Co. Builds Plant

Day Co. of Canada Ltd., Fort William, Ont., will begin operations soon in a new plant in Toronto, Ont., which will have 10,000 sq ft of floor space. The firm makes dust control systems.

Chrysler Lets Plant Contract

Chrysler Corp. of Canada Ltd. awarded a contract for constructing an engine manufacturing plant in Windsor, Ont. The plant will be an addition to the present engine factory and is part of the recently announced $21-million program to double engine production. Nearly 400,000 sq ft will be provided by the addition, most of which will be used for manufacture of V-8 engines. Completion of the building is scheduled for the end of this year.

Steel Fabricator Expanding

Wall-Derkiss Inc., Linden and Perth Amboy, N. J., is expanding its plant and field service facilities. This firm, engaged in lead, steel and alloy fabrication, was organized to carry on the business of Derkiss Lead Burning Contractors and Derkiss Fabricators Inc. A. F. Wall, industrialist and president of Wall-Colmonoy Corp., recently acquired a substantial interest in the new corporation and is its president.

Plans call for immediate work on regionally located plants and field service facilities at Mont-

a new cutting tool

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ILLINITE

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ILLINITE Power Blades are characterized by a *positively* controlled tooth setting method and heat-treating process, plus an engineered tooth and gullet design.

1. Setting of Teeth . . . by the ILLINITE method assures uniform tooth loading. Each tooth removes an equal amount of metal as the blade passes through the work, minimizing tooth stress.
2. Heat treatment . . . over 40 years of metallurgical experience assure the quality of every ILLINITE Power Blade.
3. Tooth and Gullet Design . . . is proportioned for greater strength and maximum chip carrying capacity.

All ILLINITE Power Blades, both all-hard *High Speed Steel* and composite *DuWeld* have ⅓ more cutting teeth per blade . . . visible proof of faster cutting and longer life. Write for Bulletin PB-2154 for complete ordering data and "cutting points."

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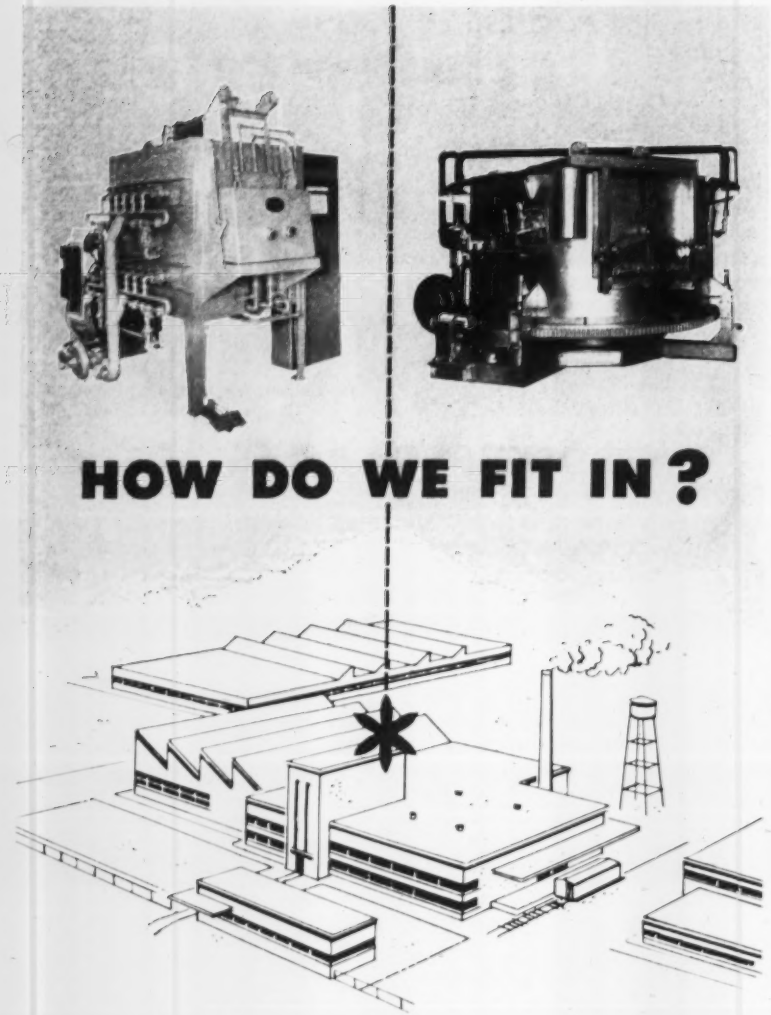


Busy, busy, busy. An extremely busy man is the metal plant executive, especially when a new plant or plant modernization is the order of the day . . .

Busy, busy. Material handling equipment, conveyors, cranes, electric motors, lathes, presses, grinders, valves . . .

How do we fit in? Here's how:

Our company manufactures furnaces for forging and heat treating — and it's good, dependable equipment. We fit into your plans because we make rotary or straight-thru designs, continuous or batch. Our furnaces can be direct, radiant tube or convection heated. And we are particularly experienced in the high temperature field . . .

Besides, we install cooling tables and conveyors, charging equipment and manipulators — everything required to make a complete furnace line!

In your own case — how do we fit in?

SALES REPRESENTATIVES

LEWIS C. BAXTER, 2207 Ashland, Toledo 10, Ohio
McCONNELL SALES & ENGR. CORP., 2809 Central Avenue, Birmingham 9, Alabama
NOBLE EQUIPMENT CO., P.O. Box 39, LaGrange, Ohio
KLIKA-STRIEBEL CO., 53 West Jackson, Chicago 4, Illinois
CHRISTY FIREBRICK CO., 506 Olive Street, St. Louis 1, Missouri
DAVID S. REYNOLDS, 34 Alderwood Road, Boston (Newton Centre 59) Mass.

THE GAS MACHINERY COMPANY
16116 WATERLOO ROAD
CLEVELAND 10, OHIO

Designers • Fabricators • Erectors
Gas Plant Equipment and Industrial Furnaces
THE GAS MACHINERY CO. (Canada), Ltd.
HAMILTON, ONTARIO

ebello, Calif., Blasdell (Buffalo), N. Y.; Morrisville, Pa., and Houston, as well as Montreal, Canada, and Lanarkshire, Scotland.

Other officers of the company are: A. J. Allen, executive vice president; M. N. Levers, vice president in charge of sales; and J. Masters, plant manager.

Long-Range "Hot Foot"

AT A FLIP OF A SWITCH, a Southern Pacific train dispatcher in Dunsmuir, Calif., now can ignite gas burners under the railroad's tracks more than 200 miles away to keep snow melted away from track switches.

This latest remote control system of protecting railroad track in winter, assuring the ice-free movement of 20 power-operated switches, has been placed in operation along 62 miles of track north of Klamath Lake, Oreg.

Each switch installation is fed by a 1000-gallon propane gas tank, located 40 or 50 feet away from the track, a supply sufficient to keep burners fired for about two weeks.

Collins Buys Cheney Company

Collins Co., Collinsville, Conn., acquired the Henry Cheney Hammer Corp., Little Falls, N. Y., and will move the operations to Collinsville. Collins Co., established in 1826, manufactures machetes.

United Gets Order from England

United Engineering & Foundry Co., Pittsburgh, received an order from Dorman, Long & Co. Ltd., Middlesbrough, England, for a mill for rolling standard structural sections and wide flange beams up to 36 in.

Gets Dalmine Product Agency

Charles A. Koons & Co., New York, was appointed exclusive American agent for products of Dalmine, S.p.A., Milan, Italy. Dalmine products include seamless steel casing, tubing and line pipe; hot and cold-drawn tubing; heavy

HIGH SPEED FLAT WIRE MILLS

These high-speed Torrington units are designed to roll flat wire at high production rates. Available in a wide variety of sizes with automatic controls, they provide maximum flexibility. Combinations of two or three flattening stands together with edgers accommodate a great variety of work. Handles 4,000 lbs. weight at entry, up to 1,000 lbs. on winder, with speeds as high as 3500 FPM and more. All operations can be performed by power—pneumatically, hydraulically or by electric motor—under operator's control at a main pulpit or at control stations advantageously located.

THE

TORRINGTON

MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT

wall pipe; carbon, alloy and stainless steel tubular products manufactured to American specifications and including seamless containers for high-pressure gas service, seamless light and power transmission poles.

Torrington Builds Plant

S. W. Farnsworth, chairman of the board, Torrington Mfg. Co., Torrington, Conn., announces that a plant has been completed at Oakville, Ont., for its Canadian subsidiary.

Equipmentmaker Moves Plant

Kopp Scientific Inc., maker of scientific and laboratory equipment, is moving its New York City plant to Springfield, Mass. The company recently acquired the business of the American Time Division of Holly Corp., Springfield, and will continue its production of its line of industrial timing devices.

Alcock Heads Welding Group

James N. Alcock, Saginaw Welding Supply Co., Saginaw, Mich., was elected president of National Welding Supply Association, Philadelphia. Organized in 1945, the association now is composed of over 400 distributors and manufacturers of welding supplies and equipment.

Ballard Mfg. Expands

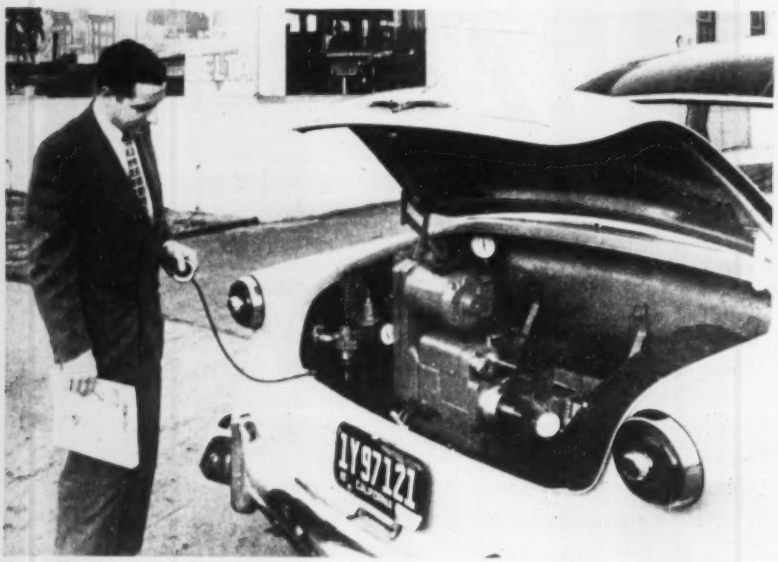
Ballard Mfg. Co. constructed a plant at 8937 National Blvd., Los Angeles, for subcontracting of aircraft parts.

Metal Spinning Firm Expands

Roland Teiner Co. Inc., Everett, Mass., metal spinning company, has added a new Hydroform machine to its facilities. It is being used for experimental work on long and short-run jobs.

Baker Buys Goldsmith Bros.

Baker Platinum of Canada Ltd. purchased Goldsmith Bros. Smelting & Refining Co. Ltd., both of Toronto, Ont. George H. Scott, Baker vice president and general manager, has been named vice president and general manager of the new subsidiary. Business of the Goldsmith firm will be conducted in Toronto from the King Street East premises of the Baker company, and Baker will use the Goldsmith sales office in Montreal.



Salesman Develops Car-Borne Tool Display

To prove to prospective customers that the new line of self-contained Rockwell (formerly Delta) air-hydraulic drill units will repeat a precision depth of within 0.0001 in., salesman W. V. Kirby, of Harron, Rickard & McCone Co. of Southern California, developed this car trunk operating display. Electricity is supplied through a 50-foot extension cord which can be plugged into any available outlet. Air is provided from a built-in 30-gallon storage tank

2

STEEL's 1954 Management Series . . . .

The editors of STEEL herewith present the second in their ten-part series, Program for Management for 1954. The complete list:

1. Now You Have To Sell (Feb. 22, p. 91)
2. Build Better Bosses
3. Automation—How Much?
4. Regularizing Production, Employment
5. Distribution—Integration Needed
6. Distribution—Training Personnel
7. Distribution—Transportation
8. Product Diversification
9. Foremen—Bridge to More Efficiency
10. Product Design

No. 2 in 1954 Management Series

STEEL

Build Better Bosses

Planned management development can increase the competency of your executive and supervisory people in today's competitive era, provide reserves for the future, ease succession problems

"HEAVEN HELP the company if this plane cracks up," muttered the treasurer as he fastened his seat belt. The president, two veeps, general manager, sales manager and chief engineer sat in thoughtful silence.

Top executives of a midwestern metalworking firm, they were enroute from Washington to Chicago. The weather was stormy, the flight was two hours late.

Although the seven were genuinely frightened, they had statistics on their side. Loss of a company's first team of management in a single disaster is a remote prospect. The commonplace — death, disability, change of job, retirement and other normal events — presents the clear and ever present danger.

Needed: New Executives — If your company is to prosper, even survive, it must have trained and experienced younger men ready to step up.

If you are to expand, you will need additional management to staff new divisions and departments.

Your employees are the most logical source of talent. To prepare them for the call to greater responsibilities, a sound program of management development is needed.

On the Upsurge—Progressive major companies are recognizing this situation. An estimated 35 per cent have methodical programs for training management men. Majority were started after World War II. Many are less than two years old.

Companies that do not have programs are showing intense interest in them. They are turning to colleges, management consultants and professional associations for expert guidance and a helping hand.

Nature Too Slow—"Management development can no longer be left to 'chance,'" says Lawrence A. Appley, president, American Management Association. "It is no more reasonable to expect an individual to become a competent manager through mere exposure to management and management situations than to expect an individual to become a doctor or surgeon by working in a doctor's office or assisting in the operating room."

Why the Interest?

The postwar interest in management development arises from four major factors:

1. Business organization and the management job are becoming increasingly complex. It requires more specific training.

2. More individuals coming up to management levels have been

Industry Trains Its Leaders For Broader Responsibilities

By LAWRENCE A. APPLEY
President, American Management Association

THE UNUSUALLY rapid growth of interest and participation in management development programs during recent years is evidence of the new emphasis that American industry is placing on the planned training of its leaders. Progressive companies are intensifying their efforts toward the systematic development of their executives both through their own internal programs and under the guidance of outside groups including professional associations, academic institutions and others.

This "return to school" impetus for executives stems principally from a growing awareness of the increasing complexity of the management job of today and of the greater scope and impact of managerial decisions and activities. The management job is larger in terms of the number of activities and volume of work; it is broader in the nature of responsibilities; and it is subject to far more outside influences and pressures than in the past.

The need for the broadest management perspective at upper executive levels, rather than specialized technical knowledge alone, has also accelerated demands for educational assistance. Management personnel are also becoming increasingly conscious that management is a profession, requiring special preparation and skill. As a result, they are growing more aware of their broader responsibilities and even more determined to fulfill them effectively.

Coupled with these reasons for carefully planned management training is the compelling scarcity of qualified executives in the employment market, making it impossible to assume that men will always be available from outside to fill vacancies or to staff the new positions created by business expansion.

The gift of the first "graduating class" of the AMA Management Course, which has been running for more than two years at the Hotel Astor in New York, was an old-fashioned school bell. It was intended to represent the beginnings of some spirit of tradition for those who would follow. It is rapidly becoming known as "the school bell on Times Square." It is a symbol of all the management education that is taking place throughout this country of ours in classrooms and at seminars, conferences, and exhibits organized by companies, educational institutions, professional associations, and others. All in all, this has become a "big red schoolhouse" operation.

Management people do not hesitate to take specific and, if necessary, drastic action in relation to marketing, manufacturing, legal, financial, and other activities of the business. There is absolutely no reason why they should be the least bit reticent or evasive about meeting the needs for further education and training of people in and for management. Apologies are no longer required. Neither does our approach have to be to sneak up on the blind side of individuals. Most of them want more knowledge, are looking for it, and are just waiting for the next level of management above them to give them the opportunity.

specialists during their early years. They need broadening. An engineer needs insight into finance and sales, skill in human relations and knowledge of labor problems before he takes on broad executive duties.

3. We are entering a competitive era. During the superboom of the last 13 years, mistakes by management could be washed out in the upsurge of production and profits. With the return of keen competition, mistakes in judgment or failure to move aggressively in the right direction can be costly, even disastrous.

4. We are facing a long-term expansion. A growing population means expanding business. More managerial talent will be required.

Turnover High—The turnover rate among your own company's executives probably would surprise you. Seven or eight years is a high average tenure.

Promotions alone take a heavy toll. While the men moved up are not lost to their companies, each promotion creates the need for secondary promotions.

A survey of the 1000 highest paid executives in General Motors Corp. made several years ago shows that 55 per cent had at least one promotion in the last five years; 20 per cent had moved forward twice; and about 5 per cent had three or more promotions.

If a similar analysis were made of the several thousand executives below this top group, it would show substantially the same picture, believes Merle C. Hale, GM's director of salaried personnel activity.

Definition—Management development is that activity which deals with the selection, appraisal and training of members of the management team at all levels of supervision. It provides a supply of young potential management candidates, increases the competency of all managers in their present jobs, and assists in preparing present managers for the assumption of larger responsibilities.

In a sense, management development is as old as management itself. Enlightened executives and supervisors always have schooled and guided promising juniors to succeed them. But as a planned

comprehensive and continuing program for the development of supervisors and executives, management development is only now being adopted on a large scale by American industry.

It Figures—The smaller they come the harder they fall. Large corporations are taking the lead in management development. Yet smaller companies often have graver succession problems. When Mr. Big of Small Company passes out of the picture and a competent replacement is not available from the junior ranks, that company often becomes a "victim" of sale or merger.

William A. Lyon, superintendent of banks, New York, warns that more and more small and medium-sized banks are permitting their identities to disappear through failure to come up with new hands to which the scepter of management may pass. "Bank directors are obligated to create a replacement program through the ranks to the top. It is as much part of the responsibility and obligation of a bank's board of directors to build up management reserves as it is to establish loss reserves for assets."

Management's Job—Executives of major metalworking companies interviewed by STEEL insist that management development is a part of management itself. It cannot be considered a frill. Responsibility for developing a second and third team is inherent in top management—although the job itself can be delegated.

Making of a Manager

How does a company get started on a management development program? There is no ideal, packaged program. Your company needs a tailor-made job. But you will want to take a look at what others are doing.

Westinghouse Electric Corp. in 1950 assigned a committee of high-ranking staff people to review the approaches of 10 companies. From this study the company proceeded to outline its own program. Standard Oil Co. (New Jersey) studied the methods of 17 blue chip companies before formulating its program.

In both cases the move was instigated by the chief executive officer.

Conditions — Substantial agreement is found on the conditions necessary to the success of any management development program. These are:

1. Active support by top management. If the head man is not prepared to support the program, it is foredoomed. Every organization has its quota of individuals who resist change of any kind. They will sabotage a development program if it does not have the support of top management.

2. Participation in development. The senior executives who are going to operate under the plan should have a hand in its development. They then will be more in favor of the program and more anxious to make it work.

3. Staff assistance. No plan will work by itself. A high-ranking member of the organization should be charged with co-ordinating the program and seeing that it is carried out. Preferably, he should report directly to the president.

4. Know your objectives. Continental Can Co. set forth the following:

To know what personnel resources it possesses and where they are located.

To tap those resources to the fullest extent.

To develop those resources to the maximum.

Findings—Among the most progressive companies certain management development practices recur time and time again. In addition, the firms have developed scores of techniques to get tailored results within their organizations.

Elements of Plan—The common elements in most development programs are:

1. Organizational planning to determine the company's present and future needs and to focus attention on the areas of greatest importance. No development program can be a success unless the

Dale Carnegie students practice "warm up" techniques for . . .

Putting Across the Idea

THE MEN who climb the management ladder the fastest are those who can think on their feet and express themselves effectively. It is an art and a skill that needs to be learned by candidates for managerial posts.

General Motors sponsors thousands of its men in the Dale Carnegie course in effective speaking and human relations. Many of the large steel companies retain instructors in public speaking. Advertising clubs and management associations in most major cities sponsor classes. Commercial classes, widely available, draw support from industry through tuition-refund plans.

Harvard's Aldrich Hall provides air-conditioned comfort for . . .

Polishing the Brass with Ivy

ADVANCED MANAGEMENT courses for mature, experienced executives are offered by many large universities, some smaller colleges. They range from intensified, live-in, full-time programs which take the older student away from-work, home and social responsibilities, to night courses and short lecture series.

Perhaps the best known is the Advanced Management Program offered by Harvard University's Graduate School of Business Administration. Concentrated within 12½ weeks, it is intended for men who have been sent by their own organizations and are considered by top management to be capable of assuming greater responsibilities.

A typical class numbers 150 men dubbed "retreads" by undergraduates. They represent about 120 blue chip companies. Expenses, totaling more than $2000, are paid by the employer. Companies also continue to pay the executives' salaries while they are at school.

The study program is equally divided among six subjects: Business policy; administrative practices; business and the American society; cost and financial administration; market development and sales policies; and problems in labor relations.

Emphasis is on case studies.

A major benefit of the course is in the after-hours discussions among executives from various types of companies. Many alumni consider the cross fertilization of ideas more important than the formal study program.

Classes Over, "retreads" head for Hamilton Hall dormitory

company knows what it needs and where it is going to use it.

2. Definition of what key positions require in terms of training, experience and special skills.

3. Key personnel inventory, or executive audit, to determine what the company has in its ranks. Such an inventory must be kept up-to-date by periodic appraisal of the performance, abilities and growth of the individuals.

4. Replacement inventories to map the availability and promotability of management personnel.

5. Means for individual development of candidates for promotion.

Outline for Development

Organizational planning should cover current operations and executive needs, plus a considered look at the company's future. What growth is anticipated in the next three, seven or ten years? Will the company expand its product line? Its facilities? Will it enter new markets?

Once top management agrees on the type of organization it is working toward, it can decide what its management needs will be in the future.

Defining Jobs—Second step is to define the key positions and what they require. While most executives believe they know the basic requirements of their subordinates' positions, they should back judgment with orderly analysis to assure that no significant factors have been overlooked.

A written analysis helps pass the information along to others concerned. It should be brief and highlight the objective of the position, its scope and responsibilities.

Personnel Inventory—A record of the company's key personnel resources is essential to any methodical management development program. It should be on paper and in easily available form. It is a key that permits a management development program to achieve its objectives.

Attainment of objectives hangs on an effective, usable personnel inventory or executive audit. It is the means of bringing together the organization's managerial needs and the potential of individual supervisors.

Battelle Memorial Inst.

Conference Leadership—A Management Skill

MEETINGS to solve problems, agree on courses of action, impart information and instruction are a top function of today's executive. Conferences take many hours of his work week. They are desirable and inescapable. But often they are an awful waste of time.

Effectiveness of conferences can be increased and wasted time minimized if the leader is skilled in conducting the meeting and the participants schooled in taking part. A brief course in conference conduct can pay rich dividends in management development.

Procedure—Procedures used by Detroit Edison (see p. 86) are typical. They come from the experience of many companies.

The planned inventory provides for periodic appraisal of the performance and potential of supervisors at all levels. Appraisers are three or more persons (optimum four) from a level higher than the person being looked at. The immediate supervisor of the person under scrutiny is chairman.

The appraisal group reviews the performance of the individual including his methods and results. It analyzes his personal qualifications and notes his greatest strength and most noticeable weakness. It agrees on his potential and current status. Is he promotable? When?

Detroit Edison and many other companies use a color code on the organization chart to denote status and potential.

Review—Second phase of the inventory is review of the appraisal board's findings before a higher management group or review board. This body may recommend techniques for future development of the appraised, suggest changes in organization, means of improving supervision or other corrective or strengthening measures suggested by the review.

The review board, incidentally, passes judgment on the appraisal board reporting to it. And so on up the ladder.

Discussion—Third phase is to discuss conclusions with the appraised. This permits management to specify what is expected of him and to inform him how well he is meeting expectations. It allows the appraised to question findings and to air his own feelings about his job, his supervision and his future.

The discussion requires tact and understanding on the part of the higher management man. He must use judgment in deciding what portions of the appraisal to reveal to the appraised. He must encourage discussion and questions from the appraised.

Generally, appraised individuals welcome the opportunity for discussion. In a planned inventory, everybody gets covered. The quiet boys know they are not being overlooked. Discussion opens communications. Every man has a chance to sit down with his boss and talk about himself. He likes it.

Development—The first three phases set the stage for the fourth—development. The appraisal and its discussion with the appraised have revealed strengths and weaknesses. The appraised knows how he stands. It leaves the appraised with a strong sense of responsibility for his future growth—and the root of any development program is the individual's desire to improve himself.

Charles E. Wilson, former General Motors president and now Secretary of Defense, puts it this way: "It is necessary to think of the problem from the standpoint of the man who is developing himself rather than from the standpoint of the man who is being developed by us."

On the Job—The hard core of management is as it always has been—the day-by-day, on-the-job contact between subordinate and superior, the experience gained by handling situations, by successes and failures on the job and the counseling of juniors by superiors. By experience and by observation

Four Steps in Management Inventory and Development

1. APPRAISAL—

An annual review of the performance of each supervisor is made jointly by three or more higher level supervisors who are in the best position to evaluate his performance and potential. Discussion centers on the performance, personal qualifications, potential, and current status of the supervisor concerned. It also considers the steps that should be taken to help him develop. Only those results on which there is unanimous agreement are recorded.

2. REVIEW—

Appraisals of supervisors reporting to an executive are presented by him to a Review Board. This board is composed of three or more executives of higher level than the reporting executive and includes his own superior. He discusses the status of those reporting to him, reviews their appraisal, and indicates steps planned for their development. The board members ask questions, make suggestions and indicate their reaction to the appraisals.

3. DISCUSSION—

Appraisals are reviewed with supervisor appraised by his immediate superior. The tone of the review is one of frankness. It should be helpful and encouraging, not critical. Specific possible avenues for improvement are jointly explored.

4. DEVELOPMENT—

Continuing development of the supervisor takes place in two ways: (1) short range specific small changes agreed on in the interview, and (2) long range changes planned in the interview or designed by higher management.

(From Detroit Edison Co. plan)

the managerial candidate learns what will work and what won't.

Technique Can Help

Supplementing this central core are scores of techniques, parading under hundreds of names, that will speed up and improve the development of a manager. Some of the techniques which have helped follow.

Psychological Counseling—Consulting psychologists are made available to supervisors for guidance on their supervisory problems. If the psychologists are from outside the company, they are less likely to become involved in company politics or to become suspected of being involved.

Psychologists may help in correcting maladjustments in the individual. Approved pyschological tests may detect weaknesses that escape notice of superiors. Once recognized, corrective steps can be taken.

University Courses—More than a score of universities are offering courses in advanced management to seasoned executives. They may be valuable as "brushups" or useful in broadening the individual's knowledge.

Colleges may also supply education in areas missed while the managerial candidate was in school or supply specific education in areas needed.

Conference Training — Conferences are essential in modern business organizations. Important business decisions and plans of action stem from them. Well-conducted conferences consolidate the best thinking of the participants and result in programs in which all concerned can agree and understand.

Poorly conducted conferences waste a lot of valuable time, beget no decisions and no programs of action. They may lead to disharmony. There are many such conferences.

Johnson & Johnson, New Brunswick, N. J., has a 10-hour course in conference leadership that is considered fundamental in training executives.

Fast Reading—Across the desks of executives passes a heavy stream of reading material—let-

ters, memos, reports, magazine articles, books. Few are able to give this material the attention it deserves. The average individual, whose education in reading probably stopped at the sixth grade, reads at an average rate of 225-250 words a minute. Reading improvement courses, using special devices such as accelerators and flash meters, may result in doubling the reading speed of the individual, enable him to have more time for other problems.

Multiple Management—Auxiliary or junior boards of directors are used by some companies as a method of executive development, as well as a means of suggesting solutions to over-all company problems.

McCormick & Co. Inc., Baltimore, formed a junior board of 17 middle-management men in 1932. Members meet twice a month to talk over company-wide problems. Any project on which the junior board reaches unanimous agreement is submitted to the senior board as a recommendation. Later factory and sales boards were established. In 20 years the three boards sent more than 5000 unanimous recommendations to the senior board. Only 50 were rejected. Many members of the junior board now serve on the senior board.

Executive Newsletters—Periodic reviews of economic conditions, with special attention to the company's particular field but including the general economic outlook, helps supervisory personnel get the broad picture.

Job Rotation— Wherever feasible, job rotation is practiced in most management development programs. The personnel director is transferred to sales, a plant superintendent becomes an assistant to the president, an assistant plant superintendent takes over personnel duties. The broadening influence of such rotation is obvious.

Evening Dinner Meetings—Social and educational purposes are served by regular dinner meetings for supervisory groups. S. K. Wellman Co., Cleveland, holds them monthly. Starting in late afternoon, they provide a period for shop talk, a period for discussion of company matters and a talk by an outsider who presents a management problem objectively. One of the more beneficial results is the opportunity afforded men from different departments to become better acquainted and to exchange viewpoints.

Case Studies—Law and medical schools commonly use the case-study approach to instruction. More business organizations are taking advantage of this method to teach executive candidates. Usually a problem is presented and the group invited to seek a solution. Realistic cases from outside a company can be discussed frankly without treading on an associate's toes. A case from the company's own history, of course, is likely to be more interesting. Often the problem is presented with the use of visual aids.

"Assistant" Jobs—Work as an assistant to an executive offers opportunities to learn administrative practice by observation and practice. At the same time such practice does not impose too important responsibilities before the candidate is ready for them. A young man of promise can learn much in such a position and relieve his superior of a load of details.

Special Work Assignments—Undertaking a special temporary task affords exercise and experience for a management candidate and often is an effective way of getting a job done. Assignments require the young man to analyze the problem, develop tact in working with other persons and departments, train him to make decisions for which he is directly responsible and to give concise reports of his progress. It has the advantage of not requiring any change of job classification or his regular location.

Periodicals at Home—Because the work week is so crowded, the best of the younger executives finds little time to read business magazines on the job. Yet these periodicals contain a great deal of information helpful to him in his job. More than half the companies sur-

F. J. Stokes Co.

Coaching—The Hard Core

CENTRAL CORE in any management development program is on-the-job experience and coaching by superior supervisors. It is the natural way for the younger man to learn. It is the route by which most top management men learned their way. The better the present management, the better will be the reserve group which will take over tomorrow

Ten Commandments

Of Good Organization

There are two kinds of efficiency: One kind is only apparent and is produced in organizations through the exercise of mere discipline. This is but a simulation of the second, or true, efficiency which springs, as Woodrow Wilson said, from "the spontaneous co-operation of a free people." If you are a manager, no matter how great or small your responsibility, it is your job, in the final analysis, to create and develop this voluntary co-operation among the people whom you supervise. For, no matter how powerful a combination of money, machines and materials a company may have, this is a dead and sterile thing without a team of willing, thinking and articulate people to guide it.

Definite and clean-cut responsibilities should be assigned to each executive.

Responsibility should always be coupled with corresponding authority.

No change should be made in the scope or responsibilities of a position without a definite understanding to that effect on the part of all persons concerned.

No executive or employee, occupying a single position in the organization, should be subject to definite orders from more than one source.

Orders should never be given to subordinates over the head of a responsible executive. Rather than do this, management should supplant the officer in question.

Criticisms of subordinates should, whenever possible, be made privately, and in no case should a subordinate be criticized in the presence of executives or employees of equal or lower rank.

No dispute or difference between executives or employees as to authority or responsibilities should be considered too trivial for prompt and careful adjudication.

Promotions, wage changes, and disciplinary action should always be approved by the executive immediately superior to the one directly responsible.

No executive or employee should ever be required, or expected, to be at the same time an assistant to, and critic of, another.

Any executive whose work is subject to regular inspection should, whenever practicable, be given the assistance and facilities necessary to enable him to maintain an independent check of the quality of his work.

American Management Association

veyed by STEEL provide subscriptions to such magazines at the employee's home where he has more time to peruse them.

Tuition Refunds—Many companies encourage employees to take self-improvement courses of their own choosing by refunding tuition upon completion of the course. Under this plan thousands of tomorrow's executives are taking courses in public speaking, taxation, statistical analysis and many other subjects on their own time.

Often the tuition refund plan is more effective than directing employees to take company-sponsored courses. The individual makes his own choice without any feeling of compulsion. He is taking the course because he wants to improve, not because the boss told him to take it.

Visits to Other Companies—New ideas and a moderate amount of cross-fertilization may be obtained by watching how the other fellow does his job. Visits may be to a competitor's plant or to one in an entirely different industry.

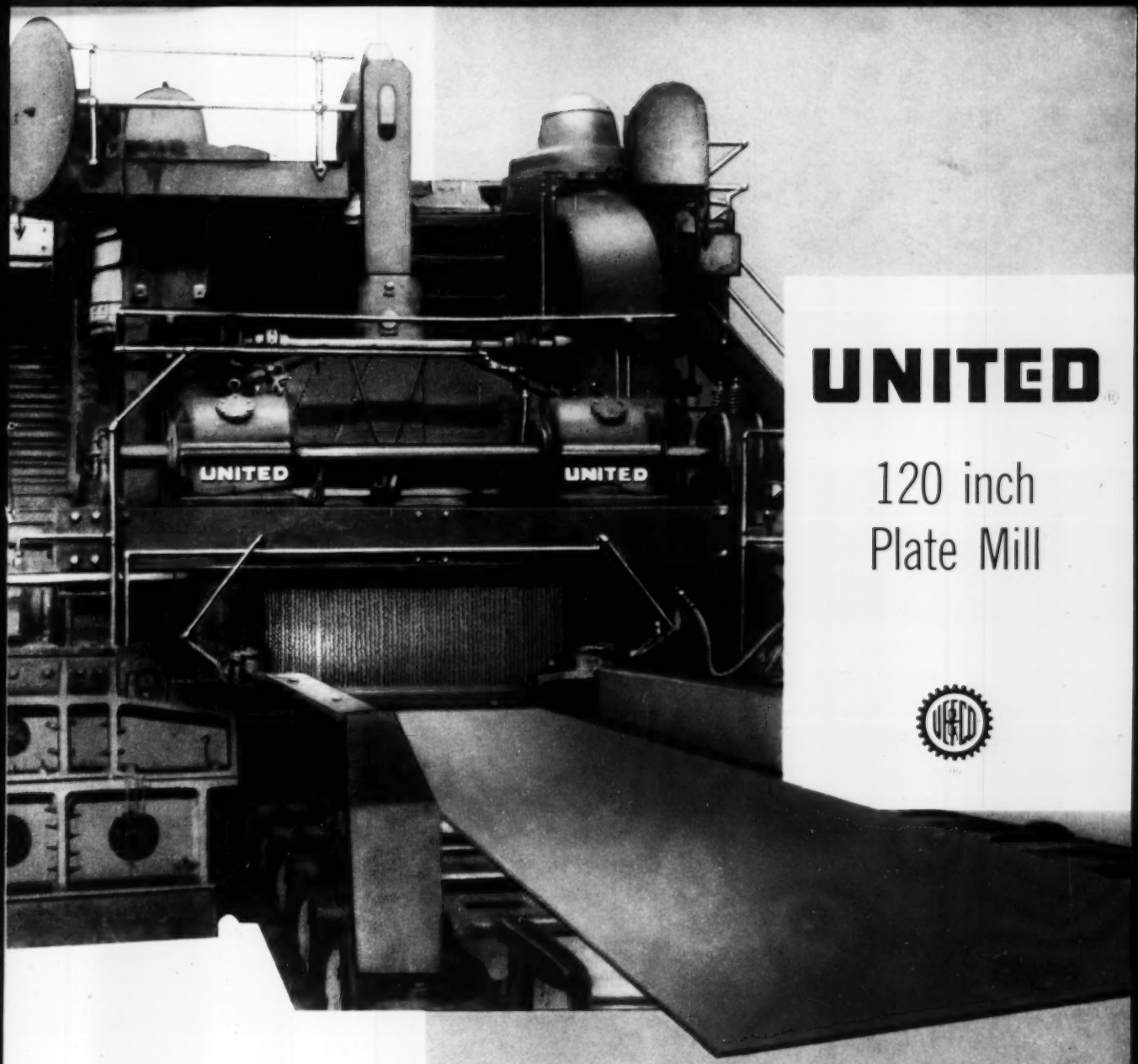
Planned Reading Programs—Growing executives can concentrate on the material most adaptable to them. Reading programs have an advantage because they can be pursued at the time and place most convenient to the individual's need.

Professional Societies—Associations are clearing houses for information on management techniques. They often sponsor special courses, seminars and conferences on specific problems.

The Best Resource

The very number of techniques already developed and almost daily being created to help train management men indicates the growing realization that good management is the best resource a company can have.

Years ago Andrew Carnegie said: "Take away our factories, take away our trade, or avenues of transportation, our money. Leave us nothing but our organization and in four years we shall have re-established ourselves." That evaluation is perhaps even more true today than when it was made.



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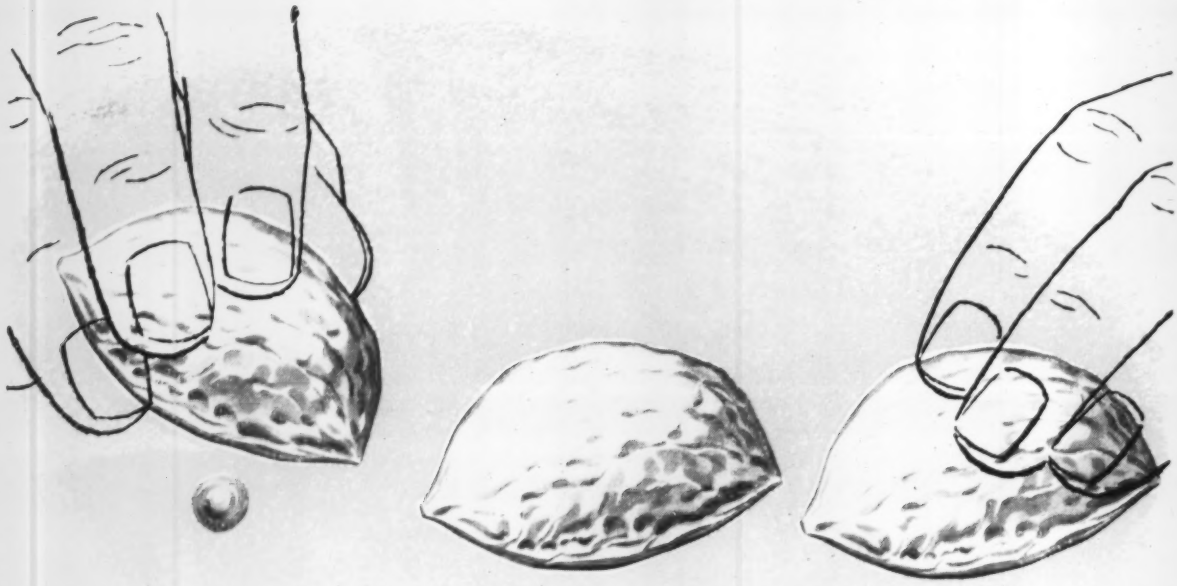

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Technical Outlook

March 22, 1954

ALLOYS—Commercial production of electrolytic chromium at Electro Metallurgical Co.'s new plant at Marietta, O., is expected to hit near the 2000-ton a year mark when in full-scale operation. Much of the chromium will go into chromium-bearing alloys for high-temperature applications, particularly the nickel-base and cobalt-base alloys in jet aircraft. Other applications include electrical resistance alloys, nonferrous alloys for metal-cutting tools, hardfacing materials and high-strength aluminum alloys.

ECONOMY METAL—Without using cobalt, nickel or chromium, researchers have come up with a heat-resistant metal (Thermenol) that is 20 to 25 per cent lighter than stainless. A modification of the magnetic material, 16-Alfenol, it belongs to a family of metals that gain heat resistance with small additions of such metals as vanadium and molybdenum and heat treatment. Naval Ordanace Lab, White Oak, Md., (they developed it) reports that material is better than some forms of stainless at 1200° F.

OPPORTUNITY—In making perfect crystals of pure iron with a tensile strength of nearly 1 million psi, GE researchers found that previous attempts failed because of atomic irregularities. Now that theory has been translated into fact, they're looking for ways to put the material to work. In addition to strength, it looks as if it will not rust.

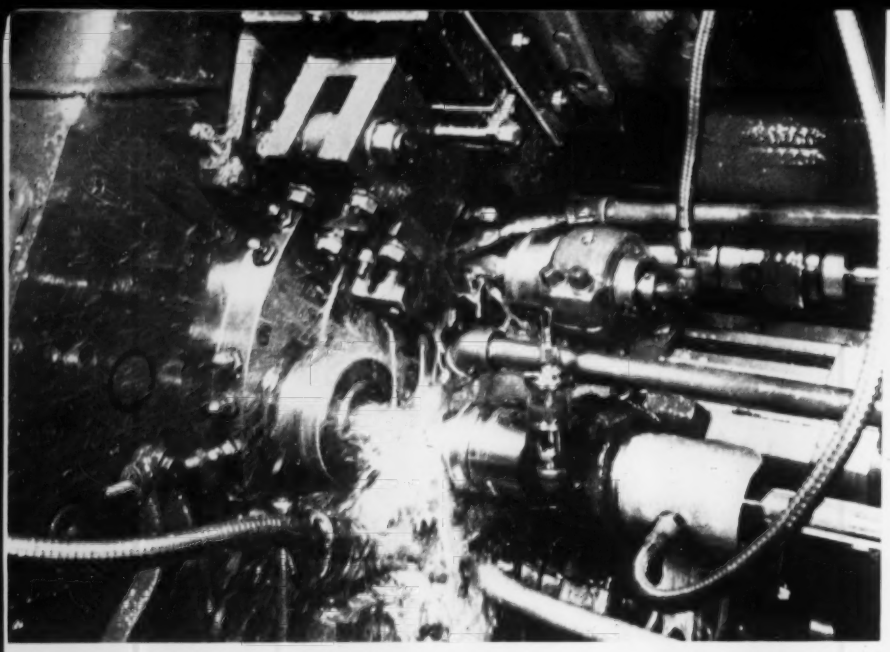
ATOMIC POWER—AEC and the Department of the Army are in the market for a small, nuclear reactor power plant with a normal full load of 1250 kw. Designed for remote arctic regions, its size and weight must allow for air transportability—for planning purposes, about 9 by 9 by 27 feet and weighing no more than 10 tons. Other specs: Electrical plant factor, 80 per cent; frequency of refueling, 12 months; maximum shutdown for refueling, 2 weeks. Companies that have expressed interest are being asked for further information. Invitations to bid will follow.

COATINGS—In 1953, lacquer industry increased its dollar volume 15.9 per cent over 1952, while over same period, paint, varnish and enamels increased 8.4 per cent. Two reasons given by Hercules Powder Co.: Modern lacquers have improved considerably in service life and outdoor durability; and you can get a two-color finish with hot-sprayed nitrocellulose lacquer in less than an hour.

TITANIUM—USAF now has a high-strength, heat-treatable titanium alloy called "3 per cent manganese complex." With heat treatment, it has optimum strength of about 200,000 psi. Its composition: 3 per cent manganese, 1 per cent iron, 1 per cent chromium, 1 per cent molybdenum and 1 per cent vanadium. It was developed at Battelle Memorial Institute.

PLASTIC TOOLS—Day may come when Detroit turns out plastic auto bodies formed with plastic tools. Phenolic and epoxy jigs, fixtures and dies for conventional metal forming are getting more than a casual glance from automen. Here's why: Average cost of plastic tooling is about 50 per cent cheaper than other types. Savings do not lie in material costs. They stem from elimination of expensive equipment for fabrication and elimination of finishing, which makes for lower labor needs. Third attraction is that a large plastic die can be made in a hurry—say about one week in an emergency.

Metalworking Outlook—p. 31 *Market Outlook—p. 127*



Abundant lubricant at the cutting edge of the tool helps get the optimum results in automatic machining

By J. D. ARMOUR
Chief Metallurgist
Union Drawn Steel Division
Republic Steel Corp.

Guide for Machining

User must balance values. Some free-machining types approach workability of bessemer screw stock. Nonfree machining types offer top mechanical, corrosion properties

HIGH ALLOY content makes stainless steels hard to machine, but some free-machining types come within 90 to 95 per cent of the rate for bessemer screw stock; and in the final analysis, all grades can be machined satisfactorily with correct tool design and machine practice.

Of course, the chromium (400 series) and chromium-nickel (300 series) stainless steels are produced in free and nonfree machining types. In the broad sense, the user knows that the regular grades will give him better mechanical and corrosion properties at the expense of machinability.

Both the 300 and 400 nonfree machining types, for example, present an unfavorable chip condition; and the 300 series of this type tends to work harden.

But to meet his day-to-day problems, the user can use more detailed information—the slight differences in machinability in different lots of the same grade, as well as gross variations, and what he can expect from a given grade in terms of speed, feed, finish and tool life.

Research — Short of costly experience, the man who uses stainless steels can turn to organizations such as Republic Steel Corp.'s Union Drawn Division for the inside story.

To anticipate average shop experience, Republic runs long tests (24 hours or more) on an automatic screw machine. In addition to the big items (speeds, feeds, finish and tool life), many variables are closely checked, including combination of speed and feed, tools, tool grinding practice, tool setup, shape and size of part, tolerance of part, type and condition of machine, oils, uniformity of metal and type of chips.

A standardized test part is used to give full information on the following ten types of machining operations:

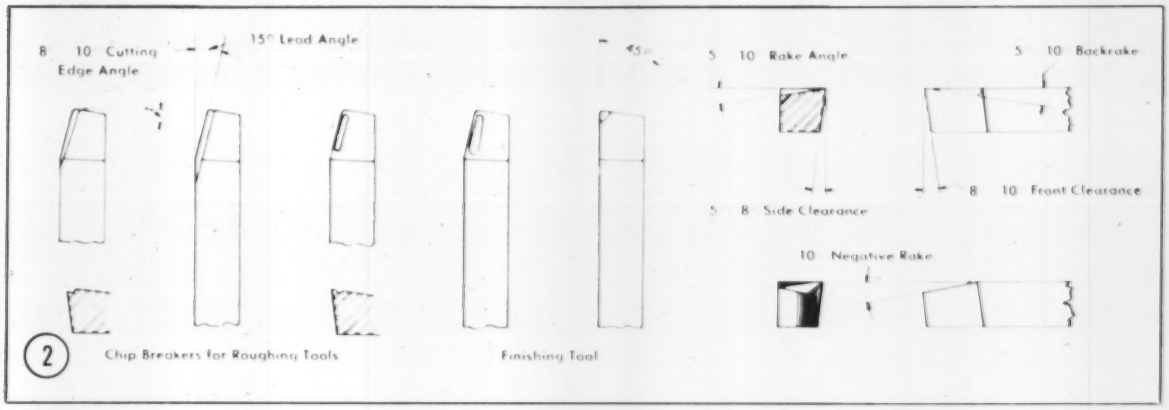
Rough and finish forms, shaving tool, cutoff, spot drill, large drill, small accelerated drill, counterbore and reamer, facing tool and tap.

Results—Backed by this work, Republic has found that good machining performance hinges upon a few fundamental practices. Among them:

1. Use of high speed or carbide-type tools.
2. Use of sufficient power to maintain constant feeds and speeds.
3. Use of high rigidity for tools, tool holders, etc.
4. Use of a good coolant or lubricant that is adjusted to reach the point of cutting in abundant flow.
5. Use of correct speeds and feeds.

The second point should be underlined. Austenitic stainless steels have a tendency to work harden rapidly. Tools must not be allowed to ride the surface of the work without cutting.

Tools—Turning tools for automatic screw machines, turret and engine lathes involve many variables, and no set recommendation can be made that will apply to all conditions. Figures 2 and 3 show suggested cutting angles for



Stainless Steels

PART ONE

This is the first of two articles by Mr. Armour. Second, which will appear in STEEL March 29, will discuss machinability research and diagnose 274 tool headaches.

straight turning tools and single cutter, bar turners. They are suggested as starting points. Of course, sizes and types may require changes.

To avoid work-hardening of chrome-nickel types, ample side and end tool clearances should be ground on all turning tools. This will prevent rubbing or glazing of the turning stock. On large diameter sections or sections where an interrupted cut is made, an increase in strength at the cutting edge is needed.

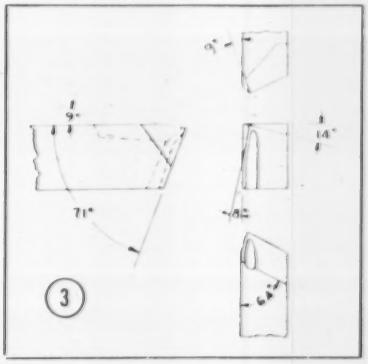
Where straight single tool turning is used, application of a negative rake angle on roughing tools has given favorable results—figure 2 shows a tool ground with a negative rake angle. If a small ground-in chip curler is used with this type tool, the chip tends to curl against the working stock. This helps break it up for easy disposal.

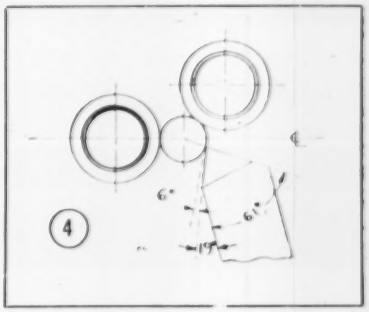
Chip Control — Some relief for unfavorable chip conditions (particularly with nonfree machining types) may be found by use of properly ground chip breakers and proper setting of tool bits.

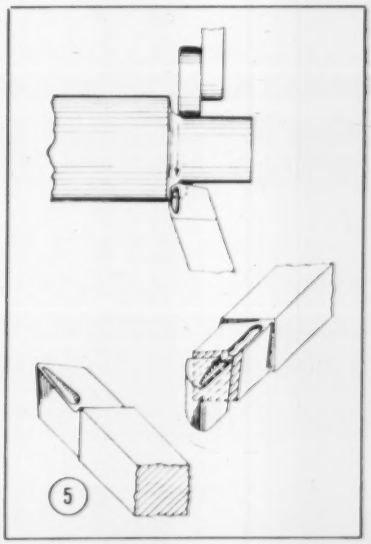
When taking heavy cuts on small diameter bars, better chip clearance between roll and top of tool bit can be had by changing the angles—see figure 4, where angles are given as starting points and may be increased or decreased to suit the job.

Chip breakers and chip curlers (figures 2, and 5) help easy chip disposal. Land and groove for chip curling are fixed by the feed and grade of stock—the heavier the feed, the wider the groove. As feed is increased and speed reduced for nonfree machining types, width of the land should be increased.

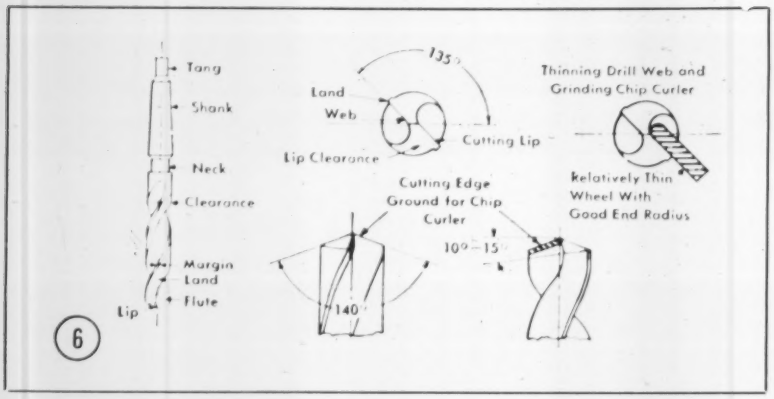
Finish Controls — All stainless steels (particularly the 300 series) offer good quality finishes. Best results call for roughing to a few







MACHINING STAINLESS STEELS



thousandths of an inch over finished size, and then taking a light finish cut.

There is an optimum finishing speed for each type of stainless, which machine operators can find in a short time. Speed should be sufficient to form a well-curled chip. Excessive speeds heat and color the chip.

Form Tools—Speed, feed and effiency here are governed by design of the tool and its relation to width, depth of cut and diameter of the turning stock.

For rough forming tools on multiple-spindle, automatic screw machines, it may be necessary to break sharp corners and increase side tool clearances to the allowable limits. This, of course, necessitates use of a finish form tool. A shaving tool operation should be added if a high grade finish is wanted.

Increases of side and end tool clearances can be made easily on simple, flat-form tools. However, on circular or dove-tail cutters little change can be made. Tools of this type should be designed for a top rake angle of seven to 10 degrees.

Drilling—General rule for drilling steels applies to stainless: Drill speeds in revolutions per minute decrease as drill diameters increase. Feeds should increase as diameters increase.

For working the 18-8 types with drills ranging from $\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter, 40 to 50 sfm is recommended as a starting speed. Feeds should range from 0.003 to 0.005 inches per revolution. When working a given type, indications show that peripheral speed may be increased to some degree as drill diameters increase.

With an increase of drill diameters from $\frac{1}{4}$ to one inch, increases of peripheral speed of 10 to 15 sfm have been made with little or no effect on drill life. The standard 118-degree included angle of high speed drill points should be increased to 130 to 140 degrees, depending upon type and hardness of the stainless stock. Drill webs should be thinned to 1/6 the diameter of the drill, with lip clearances ranging from 9 to 15 degrees. Chip curlers (see figure 6) can be ground on the cutting lips when working chrome-nickel types.

Relatively low coefficient of heat conductivity of the stainless types tends to concentrate a high percentage of the heat generated at the cutting edges of all tools. An ample supply of cutting fluid should be directed as close to the working surface as practicable. Use of "oil hole" drills, ground to proper angles and clearances, may greatly improve drill performance.

Use a small center punch for locating holes to be drilled. Excessive cold working will retard starting of the drill.

Tapping—Trouble here frequently means that tap hole diameter is too small. Where metal thickness is less than the diameter of the tap, use as full a thread as

SUMMARY TABLE—SURFACE CUTTING SPEEDS FOR STAINLESS STEEL

Type of Steel A.I.S.I. Number		Approx. Surface Feet Per Minute	% Relative Speed Based on A.I.S.I. B1112 as 100%	For Tool Speeds and Feeds, See Table
B-1112	Bessemer Screw Stock	165	100	
A-4130		120	72	
410	(Enduro S-1)	90	54	C
416	(Enduro FC)	150	91	A
420	(Enduro S-1 Hi C)	95	57	*
420F		105	63	*
430	(Enduro AA)	90	54	C
430F	(Enduro AA-FM)	150	91	A
440A		75	45	*
440B		70	42	*
440C		65	40	*
440F		90	54	*
302	(Enduro 18-8)	75	45	D
303	(Enduro 18-8 FM)	100	60	B
304	(Enduro 18-8S)	75	45	D
321		60	38	D
347		60	38	D

*No tables of feeds are given for these grades. Feeds may be estimated as follows to get approximate values:

Type 420	5-15% greater feeds than 430
Type 420F	25-30% smaller feeds than 303
Type 440A	Approximately same feeds as 302
Type 440C	Approximately same feeds as 440A
Type 440F	15-25% smaller feeds than 430

(Reprinted by permission of Republic Steel from "How to Machine Enduro Stainless Steel Bars")

CUTTING SPEEDS AND FEEDS FOR STANDARD TOOLS

TOOL NAME	SIZE OF HOLE—INCHES	WIDTH OR DEPTH OF CUT-IN.	TABLE A TYPES 416, 430F Surface Ft./Min.	TABLE A TYPES 416, 430F Feed In./Rev.	TABLE B TYPE 303 Surface Ft./Min.	TABLE B TYPE 303 Feed In./Rev.	TABLE C TYPES 410, 430 Surface Ft./Min.	TABLE C TYPES 410, 430 Feed In./Rev.	TABLE D TYPES 302, 304 Surface Ft./Min.	TABLE D TYPES 302, 304 Feed In./Rev.
		WIDTH								
Form		.500	150	.0018	100	.0021	90	.0014	75	.0016
Circular or Dove-Tail		1.000	145	.0014	96	.0017	87	.0011	73	.0013
		1.500	145	.0013	96	.0015	87	.0010	73	.0012
		2.000	140	.0011	93	.0013	84	.0008	70	.0010
		2.500	135	.0009	90	.0010	81	.0007	68	.0008
Twist Drills	.250		100	.0035	63	.0040	57	.0028	48	.0033
	.500		100	.0040	63	.0045	57	.0031	48	.0036
	.750		105	.0047	69	.0055	62	.0037	52	.0044
	1.000		105	.0055	69	.0064	62	.0044	52	.0051
	1.250		110	.0064	72	.0070	65	.0050	54	.0058
		DEPTH								
Box Tool Blades		.125	150	.0050	100	.0059	90	.0038	75	.0046
		.250	145	.0047	96	.0055	87	.0035	72	.0043
		.375	140	.0040	93	.0047	84	.0030	70	.0036
		.500	135	.0032	90	.0040	81	.0024	68	.0030
Hollow Mills		.062	135	.0072	90	.0085	81	.0054	68	.0060
		.125	127	.0058	84	.0068	76	.0043	64	.0053
		.187	123	.0050	81	.0060	73	.0038	61	.0046
		.250	118	.0047	78	.0055	70	.0035	59	.0043
Knurl Tools in Turret (On			150	.0110	100	.0120	90	.0089	75	.0099
(Off			150	.0220	100	.0240	90	.0178	75	.0198
Knurl-Cross Slide			150	.0110	100	.0120	90	.0089	75	.0099
Chamfer & Facing			182	.0040-.0060	120	.0050-.0072	108	.0031-.0043	91	.0038-.0053
Reamers Under ½"			132	.0050	87	.0060	78	.0038	66	.0046
½" or Over			132	.0072	87	.0085	78	.0054	66	.0066
		WIDTH								
Cut Off		.062	150	.0015	100	.0017	90	.0011	75	.0013
		.125	159	.0020	105	.0021	95	.0013	79	.0016
		.187	163	.0020	108	.0021	98	.0013	82	.0016
		.250	172	.0024	114	.0025	103	.0016	86	.0020

Table is based on the use of high speed steel tools and an average eight hour tool life. Feeds are based on the use of multiple-spindle type machines, using both rough and finish forming tools on cold drawn material. On lighter, single spindle machines using only one forming tool, feeds are usually much lower.

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possible. For holes with a depth twice the diameter, a 75 per cent thread depth is sufficient. For holes over twice the diameter, a 50 per cent thread is usually satisfactory.

Spiral fluted taps for blind, deep holes and chip driver taps for open holes are recommended. Two-fluted type taps are most suitable up to a No. 6 size. For No. 6 to ½ inch, use three fluted, and above this, four-fluted taps.

When tapping blind holes, be sure to allow a sufficient untapped distance for chip accumulation. For deep holes, grind the heel of the land to reduce the bearing area or use an interrupted, thread-type tap.

When working 18-8 and nonfree machining types, an increase in rake angle up to 20 degrees has helped troublesome chip clogging. This is readily done by grinding taps on a thin disc wheel dressed to a desired radius.

Do not grind taps freehand, especially at the chamfer end. Correct regrinding and sharpening of taps is a must when working stainless.

Threading—Any of the popular, self-opening die heads may be adapted for stainless thread cutting. Some trouble due to chip clogging may be experienced when backing nonopening dies from stainless threaded parts.

Reaming—For general application, use high-speed, spiral-fluted reamers, removing approximately 0.003 to 0.010-inch of stock. A good surface finish can be obtained on all stainless types.

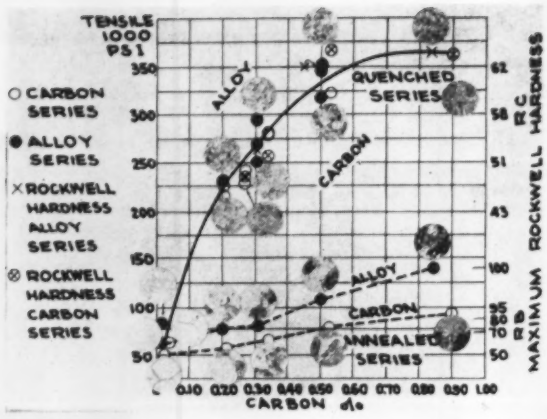
When working to quality surface finishes, use speeds of 20 to 30 sfm, with a 0.003 to 0.005-inch feed per revolution. For working to size or fit, higher speeds may be used satisfactorily.

Milling—Little difficulty should be experienced in milling operation when working stainless. Use only high speed milling cutters, as recommended by a tool manufacturer.

For comparatively wide surfaces, use helical or spiral-type cutters. They take less power for driving and produce smoother surfaces. When working diameters under four inches and cutting narrow grooves, grind the maximum amount of clearance on the cutting teeth. Small cutters need more clearance than large cutters.

Stagger tooth cutter may be used to good advantage for deep narrow grooves. Alternating teeth, cutting only one-half the slot, produce smaller chips which are more readily removed from cutting slot.

Here is the relationship of tensile strengths and hardnesses to variation of carbon content in steels



Ferrous Alloys

A Little Carbon Goes a Long Way . . .

By HARRY K. IHRIG
Vice President in Charge of Research
JOHN T. JARMAN
Assistant to Vice President in Charge Research
Allis-Chalmers Mfg. Co.
Milwaukee

Less than 1 per cent carbon in steel will increase tensiles several fold. When these materials are subsequently heat treated, high hardness also is obtained

CONSIDER the important role of carbon in ferrous alloys when designing machines and structures. No other alloying element (in such small amounts) gives similar results.

Carbon content is the key to ultimate strength and hardness. Tensile strengths of from 50,000 to 350,000 psi in steels can be had by carbon variation of less than 1 per cent.

In cast irons, the type of carbon largely determines the properties of the metal.

Research—Starting point was the melting down of killed ingot iron. Its analysis was: Carbon, 0.04 per cent; manganese, 0.21; phosphorus, 0.02; sulphur, 0.02; and silicon, 0.01. With this common base iron, a series of steels with increasing carbon content and alloy steels with nickel and molybdenum additions were made.

Sound portions of each keel block poured were removed and forged to round bars 1¾ inches in diameter. After annealing, they were machined into tensile test bars. Some were heat treated to get the maximum in hardness and tensile strength.

Heat Treatment—Effect of carbon on the physicals of annealed samples was slight, while heat treatment gave increasing hardness and tensiles with increasing carbon content for straight carbon and alloy types. This shows little is gained with higher carbon steels even in the alloy series if they are not heat treated.

Tukon tests on a typical sample showed a hardness of 60 to 97 Knoop in the soft ferrite or iron phase. A carbide constituent of the microstructure tested 220 Knoop.

Starting at the quenched end of the specimen, hardness of carbon steels falls rapidly. Same diminuation is found in the alloy series, but it is less rapid.

So alloy content increases depth of hardening but not maximum hardness. In thin sections, carbon steels can be heat treated to match the hardness and strength of alloy steels of the same carbon content.

Carb and Decarb—Carbon may be added or removed from steels without melting them.

Carburization adds carbon to the outer layers of steels. After they are heat treated, their outer layer is strong and hard. Cores are relatively soft and ductile. A gear showed a case with a hardness of Rockwell C-61, while its core was C-36.

In decarburization (rarely done intentionally) carbon diffuses to the surface and is oxidized. This often happens in annealing and other heat treatments. A test piece of 0.85 per cent carbon steel was totally decarburized to a depth of 0.21 inch. Tensiles fell from 87,400 to 62,250 psi.

Carbon migrates in steels being welded. A carbon steel welded with an austenitic, stainless steel rod to eliminate the need for stress relieving may embrittle the weld metal. Carbon may diffuse from the adjoining carbon steel.

No Help Here—Stiffness of all steels within the elastic limit is the same regardless of carbon content or heat treatment. Carbon content also has little effect on hot workability.

In all magnetic fields tested, magnetic permeability decreased with increased carbon content. And ductility is reduced with increasing carbon content, particularly in the heat treated condition.

Hydrogen under high pressures and temperatures converts carbon in steel into methane, to form blisters or leave voids where the carbon had been.

Others — Carbon has the same function in hardenable stainless steels as it has in carbon and low alloy steels. For example, it is

PHYSICAL PROPERTIES OF QUENCHED AND ANNEALED STEELS

HEAT	ANALYSIS	TENSILE 1000 PSI	ROCKWELL HARDNESS	HEAT TREATMENT
1	C.02, Mn.20, P.007, S.024	51.0	54B	Annealed 1800° F, slow cooled
1	Si.01	59.4	78B	Quenched 1800° F, 15% brine 70° F
1A	C.04, Mn.14, P.008, S.025	59.0	64B	Annealed 1800° F, slow cooled
1A	Si.01, Ni 1.43, Mo.52	83.8	88B	Quenched 1800° F, 15% brine 70° F
2	C.21, Mn.10, P.13, S.021	56.8	56B	Annealed 1670° F, slow cooled
2	Si.008	218.0	46C	Quenched 1670° F, 15% brine*
2		225.0	46C	Quenched 1670° F, 15% brine*
2A	C.20, Mn.15, P.008, S.025	72.4	75B	Annealed 1550° F, slow cooled
2A	Si.01, Ni 1.42, Mo.52	232.0	45C	Quenched 1550° F, water 60° F.*
3†	C.26, Mn.21, P.011, S.025	228.2	48C	Quenched 1600° F, 15% brine*
3	Si.01	243.0	50C	Quenched 1600° F, 15% brine*
3B†	C.34, Mn.18, P.007, S.023	62.3	68B	Annealed 1630° F, slow cooled
3B	Si.01	281.5	52C	Quenched 1600° F, 15% brine*
3B		280.5	52C	Quenched 1600° F, 15% brine*
3A	C.31, Mn.18, P.008, S.025	79.2	85B	Annealed 1525° F, slow cooled
3A	Si.01, Ni 1.39, Mo.52	288.5	54C	Quenched 1525° F, water 60° F.*
3A		251.0	49C	Quenched 1525° F, water 60° F.*
3A		271.5	52C	Quenched 1525° F, water 60° F.*
4	C.53, Mn.23, P.007	76.6	72B	Annealed 1525° F, slow cooled
4	S.028, Si.01	324.0	64C	Quenched 1525° F, water 60° F.*
4A	C.50, Mn.22, P.008, S.024	108.5	96B	Annealed 1525° F, slow cooled
4A	Si.01	352.0	62C	Quenched 1525° F, oil 70° F.*
4A		352.0	61C	Quenched 1525° F, oil 70° F.*
4A		347.5	60C	Quenched 1525° F, oil 70° F.*
4A		317.0	58C	Quenched 1525° F, oil 70° F.*
5	C.90, Mn.20, P.009, S.025	95.6	88B	Annealed 1450° F, slow cooled
5	Si.01	‡	63C	Quenched 1450° F, water 60° F.*
5A	C.83, Mn.23, P.008, S.025	139.0	24C	Annealed 1525° F, slow cooled
5A	Si.01, Ni 1.39, Mo.52	‡	63C	Quenched 1525° F, oil 70° F.*

† Carbon steel heats above and below carbon 0.31 of heat 3A. * After quenching, tempered at 300° F for 30 minutes, then treated at minus 100° F 30 minutes, and tempered at 300° F for 30 minutes. ‡ Broke in fillet.

needed to get hardness for cutlery.

In austenitic, chromium-nickel, stainless steels, corrosion resistance is lowered by increased carbon content. Corrosion in nitric acid increases greatly even for low carbon heats after they have been sensitized at 1200° F for about two hours.

Carbon will precipitate in grain boundaries of austenitic stainless steels not containing stabilizing elements when exposed at 800 to 1500° F. These are the temperature ranges of stress relieving and welding. Chromium migrates into the boundaries. Chromium carbides are formed and these carbides resist corrosion.

The grain areas next to them have been partially depleted of chromium, to make chromium carbides—so these chromium-impoverished areas are attacked. If attack proceeds, metal finally becomes a mass of loose crystals. Metal next to the grain boundaries dissolves.

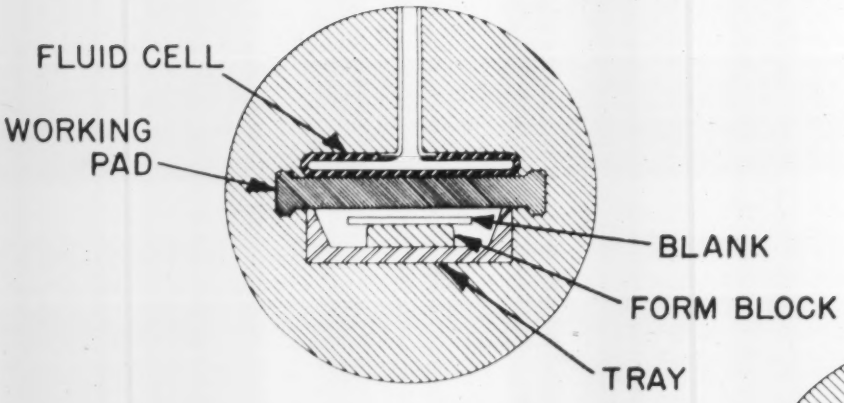
To prevent carbide precipitation of chromium-nickel stainless steels, carbon content must be extremely low or such elements as titanium, columbium or tantalum must be added to preferentially react with the carbon.

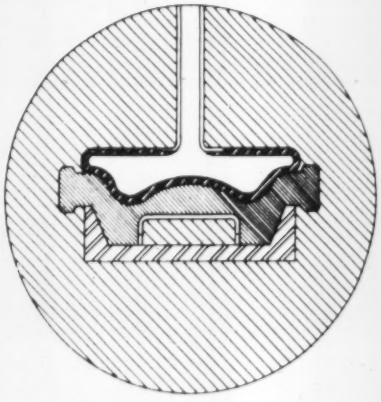
Three Irons—In white, nodular and gray cast iron, carbon is almost entirely in the form of graphite or elemental carbon.

Carbon is almost entirely combined with iron in white iron, to form the hard and brittle iron-carbide compound. After annealing, it is converted into graphite lumps in a matrix of iron. Product is a softer and more ductile malleable iron. Because it is necessary to chill such iron, it is not possible to make heavy sections (usually over 1 inch) in white or malleable iron.

Graphite takes the form of ribbons or flakes in gray iron. Since graphite is weak, its structures are like voids of the same shape. Iron has little strength and practically no ductility, although inoculation or variation of analyses can improve strength.

Nodular iron is made directly from molten iron or by treating it with nodularizing agents. Well-defined, spheroidal graphite particles are formed in a matrix of iron, which is not broken up as it is by the graphite flakes of gray iron. Its strength is many times that of gray iron of the same analysis. Its properties are similar to steel.





Slight vacuum in fluid cell permits entry and exit of work (left). Inflated cell displaces pad (right)

Rubber Pad Press Gets New Muscles

Working pad is displaced down over work by pumping hydraulic oil into fluid cell. More complete forming is result, because both face and side pressures are uniform

WHEN THE AIRCRAFT industry wanted deeper flanges in heavier gage parts, it naturally turned to its old standby, the conventional rubber pad press. Instead of coming up with a solution, it ran into something of a stone wall.

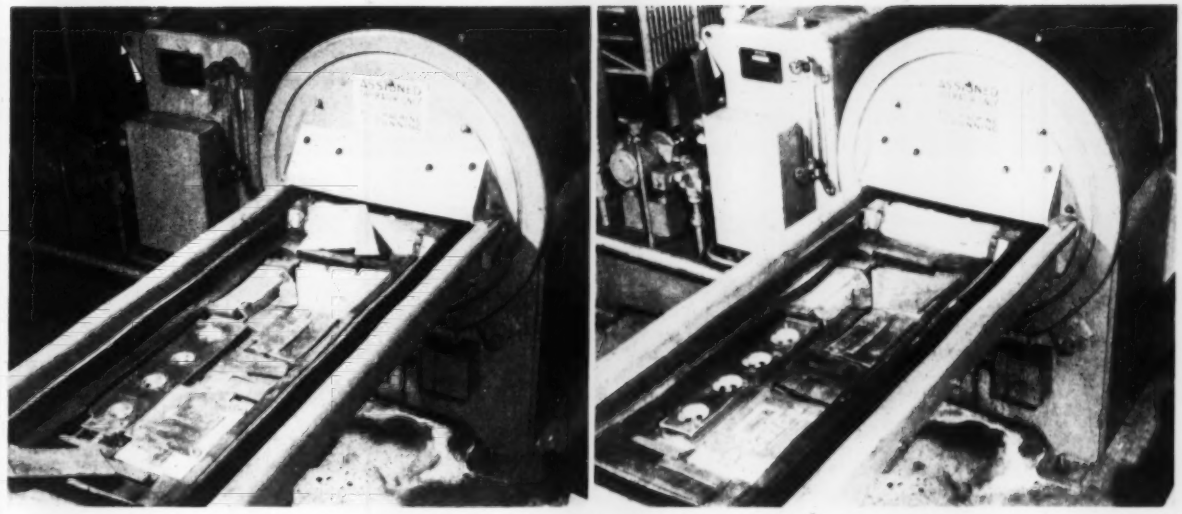
To get higher unit pressures to bear on work, such gimmicks as smaller platens and assist tooling were tried, but it was apparent that the realistic approach in this direction called for a press of imposing size and cost. Even at the price, there was no real guarantee that two serious shortcomings of the rubber pad process (incomplete forming, with the subsequent need for slow and costly hand forming) would be ironed out.

About two years ago, O. A. Wheelon of Douglas Aircraft Co., the firm that developed the rubber pad or Guerin process in 1935, went to the grassroots of the problem. The rubber pad press develops maximum working pressures on the face of the work. Side forming pressures drop appreciably along the depth of the work. So Wheelon asked the question: Why not displace the rubber pad with direct hydraulic pressure . . . to get uniform and much higher pressures on all parts of the work?

Today, the Verson-Wheelon press (it's produced under license by Verson Allsteel Press Co., Chicago) appears to be just what the aircraft industry ordered (STEEL, March 8, p. 115). Aircraft people (and others) are especially interested because side forming is much better and hand forming has been reduced tremendously. Gages running from 0.125 to 0.250 inch have been easily formed.

Principle—A toy balloon bursts easily but confine it in a container and it'll take several thousand psi. This is the secret of the new press. A relatively thin rubber bag or fluid cell is mounted in the roof of the press (the steel container). A rubber working pad is below the fluid cell.

When hydraulic fluid is pumped into the cell, the rubber pad is forced down over the work. The working pad is softer and has much more elongation than those on conventional rubber pad presses. At the hydraulic pressure developed (normally 5000 psi) the pad is practically fluid. Forming pressures are uniform on



Before (left) and after (right) shots show how the press works. Note number of pieces that are formed

the sides of the forming block, as well as its face.

Result is better side detail, such as joggles, "C" flanges, side beads and pillows. This one basic difference in Guerin and Verson-Wheelon machines eliminates need for much of the side pressure raising assist tools, such as wedges, draw-rings, wipers and draw bars. Assist tooling costs money in man-hours and material, creates additional storage and tooling maintenance problems, scratches or marks production work and usually requires the part to be hit more than once to form it completely.

With the conventional press, using the caged, rubber-forming technique, considerable skill must be exercised to place tools in the correct position. If multiple form blocks are used, they must be placed carefully to eliminate an eccentric or unbalanced condition that tends to create undue strains on the press tie rods or ram. New press can be loaded without consideration for such unbalance. There is no strain of machine members because of unequalized pressure.

New Look—The press looks a lot like an iron lung. A conventional, 5000-ton press, for example, is about 2½ times taller than a V-W rated at 10,800 tons. This isn't counting that part of the conventional press below floor level, because the V-W does not need a pit. Maximum ceiling of 10 feet will handle any V-W; eight feet is plenty for most.

Only moving parts are the trays that hold the work. Presses are rated by tray size. Smallest (20 inches wide by 50 inches long) has an operating pressure of 5000 psi and is rated at 2500 tons. Largest tray in production is 50 by 168 inches.

How It Works—Press is adaptable to duplex, fast-acting trays, automatic controls and interlocks. On a typical automatic cycle, the operator merely sets working pressure (which may be lower than 5000 and up to 7500 psi on some presses), punches a button, and the loaded tray moves into the press.

Hydraulic oil is pumped into the fluid cell (by first a low-pressure, then a high-pressure pump). After forming, pumps evacuate the fluid cell. A slight vacuum is maintained in it to hold up the working pad to permit removal and reentry of the tray.

Limitations—Basic principles of rubber pad press operation apply, but higher pressures require better form block materials. Plastics may be powdered and a 1-inch thick maple block can be compressed to about ⅝ inch. Aluminum or Kirksite blocks are ideal for forming aluminum. Such plastics as Richlight and Micarta have been used, and mild steel plate is good where the block can be made easily.

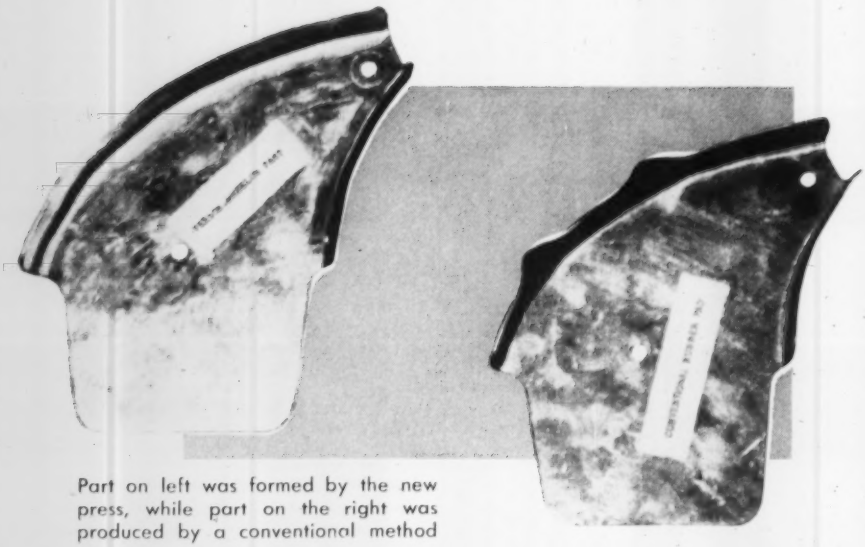
Since it's possible to extrude rubber into minute crevices at high pressures, care must be taken to avoid deep holes and voids that would cause excessive pad wear. Tall projections should be avoided for the same reason. To protect the working pad from sharp raw edges, auxiliary throw pads are recommended. They also prevent the rubber from getting under the edges of flanges, etc. Locating pins must be full length to the bottom of the block, unless shouldered. Otherwise, rubber pressure will force the pin below the surface.

In general, all simple male Guerin blocks are acceptable, providing they are strong enough. New press requires much less assist tooling, and side pressure on block is independent of block height.

Best results are obtained from form blocks that barely clear the flange and the bed of the tray. This prevents rubber from getting underneath the flange, and better forming results. This is particularly noticeable with shrink flanges in moderate gages.

Hot Work — Press is as adaptable to hot work as any rubber pad press. Hot operations are justified where material at room temperature does not have sufficient ductility to form reasonable proportions without excessive breakage.

Suitable materials include alu-

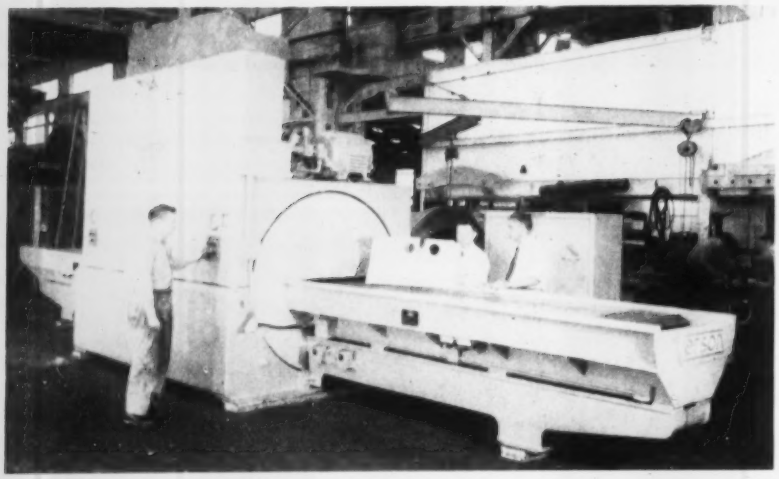


Part on left was formed by the new press, while part on the right was produced by a conventional method

minum and magnesium alloys, stainless steels and titanium. In the aluminum group, 3S-O is the easiest to form. Annealed 24S-O and 75S-O have about the same forming properties, while 61S-O can be formed more severely. The magnesium alloy, annealed FS1-A, can be formed to generous proportions at room temperature but hot forming at around 600 F is recommended to get zero springback and more severe forming. Hard rolled FS1-H is difficult to form at room temperature suggested working temperature is about 300 F.

The 18-8 stainless steels have high elongation characteristics and form well where bending and stretch are involved. Work with 4130 and 8360 aircraft steels has been fairly successful, as has been the hot forming of commercially-pure titanium (RC-70) at 700 to 800 F. Steel form blocks should be used here, and if hand work is required, torch heating is recommended.

Blanks — While routed or blanked edges may be used, breakage will be far less with a routed edge. Sheared edges should be polished in regions of high deformation, such as edges of bends, stretch flanges and lightening holes. Although it is not mandatory, adequate burring or breaking of sharp edges will give much greater rubber life.



This is one of the larger presses. Auxiliary equipment is mounted on top of the unit in this instance

Operation—Here are some points to consider in the operation of the new press.

Minimum flange (if rubber does not get underneath it) depends upon rubber pressure and strength of the material being formed. For soft materials (24S-O and 75S-O) the minimum free leg length is less than 1 t for thin gages, but this is higher for thick materials. For higher strength material, such as 24S-T and 18-8 SS, minimum for the thin gages will be about 2 t and higher for heavy gages.

In practice, it is well to stay above the theoretical minimum. Softer pads are necessary to get reasonable rubber life. When there is rubber on both sides of the part, no forming results.

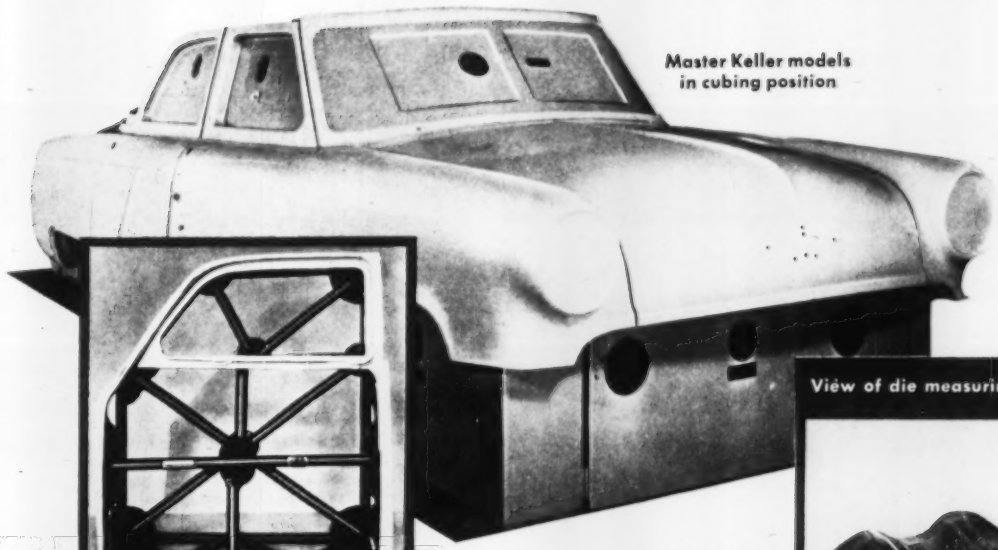
Minimum Bend Radii—This factor is limited by ductility of the metal formed and is not dependent on press pressure. Normal practice is to establish bend radii that will result in an acceptable minimum of parts that have been broken or rejected.

This will depend upon the edge conditions of the blank, consistency of the material and tolerances used in the bend radius of the block.

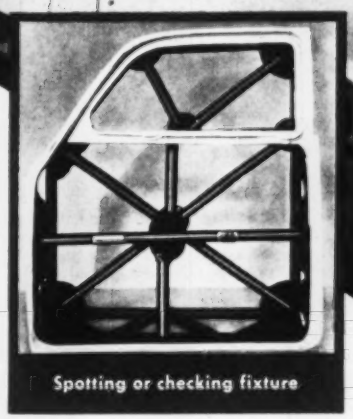
Springback — There is less springback at high than at low pressures. Minimum bend radius, rather than generous bend radius, will keep springback at a minimum. Soft tempers and/or hot work also minimize it.

To compensate for the angular recovery, blocks are usually undercut 1 to 3 degrees, so that the part will result in the correct bevel angle. When using high strength materials, and contoured flanges, it may be advisable to dish or compensate the face of the die.

Stretch Flanges—Sheared edges or predrilled pilot holes in stretch flanges should not be used except for low elongations. For large radius of curvature and high flanges, ability to stretch is principally governed by the uniform elongation of the material. This is higher for AQ or T_3 than the SO condition and is lowered by heat. For sharp radius of curvature and short flanges, the local (zero gage length) elongation of the material is more important. This value is higher for the soft SO condition and is usually raised by heat.



Master Keller models in cubing position



Spotting or checking fixture

Illustrations by courtesy of **Ren-Ite Plastics, Inc.**, Lansing, Michigan

View of die measuring 36 x 44 inches

Low-Cost Key to Fast Model Changes—

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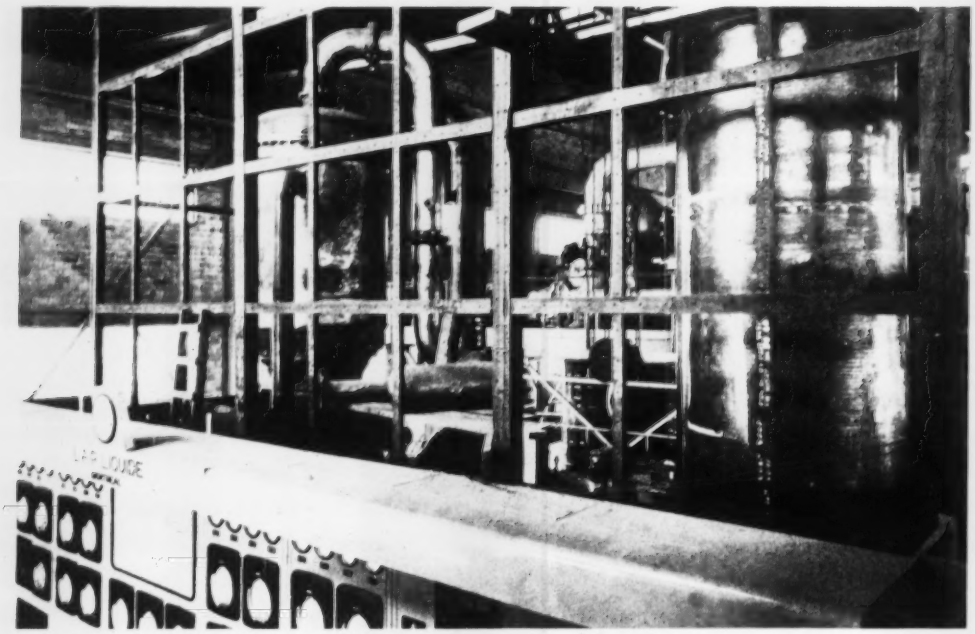

Typical of the modern 300-ton plants built today is this one at International Nickel, showing some of the liquefaction apparatus in process of erection. Cost figures in the text do not necessarily apply to this plant

How Much Does Tonnage O_2 Cost?

"Should I buy oxygen or produce it?" is what the prospective user of tonnage O_2 wants to know. Here's a recent breakdown on cost of building and running your own plant

NEARLY 100 years ago, the original Bessemer patents stressed the importance of oxygen in the steelmaking reaction. Had cheap oxygen been available in the necessary volumes at that time, the whole complexion of the steel industry today might be changed.

Modern technology, taking advantage of recently developed tonnage oxygen plants, is focusing new attention on oxygen and the role it seems destined to play in the steel industry. But costs of installation and operation of tonnage plants still the big question are hazy in the minds of most potential users.

Two Factors—Main cost-determining factors are the capacity of the plant (in tons per day) and the purity of oxygen to be produced. The following assumptions must be made to simplify the calculations:

1. Cost figures are expressed as cost per metric ton of O_2, calculated as 100 per cent but contained in a mixture of 95 per cent purity.
2. Oxygen is produced in a single plant without spare units.
3. The plant is operated to give a continuous output during 300 days per year.
4. Variations in demand will restrict the average production of the plant to 80 per cent of its maximum daily output.
5. Oxygen is delivered to a gasholder at approximately atmospheric pressure.

With these conditions established, cost figures for three typical-sized plants 50, 125 and 300-

MANUFACTURING COSTS OF OXYGEN

(in dollars per metric ton)

Maximum capacity of plant	1. 50 tons per day	2. 125 tons per day	3. 300 tons per day
Power costs	3.88	3.71	3.59
General operating expenses	3.76	2.27	1.48
Depreciation	4.15	2.77	1.91
Gross financial charges	4.15	2.77	1.91
Total cost	**15.94**	**11.52**	**8.89**

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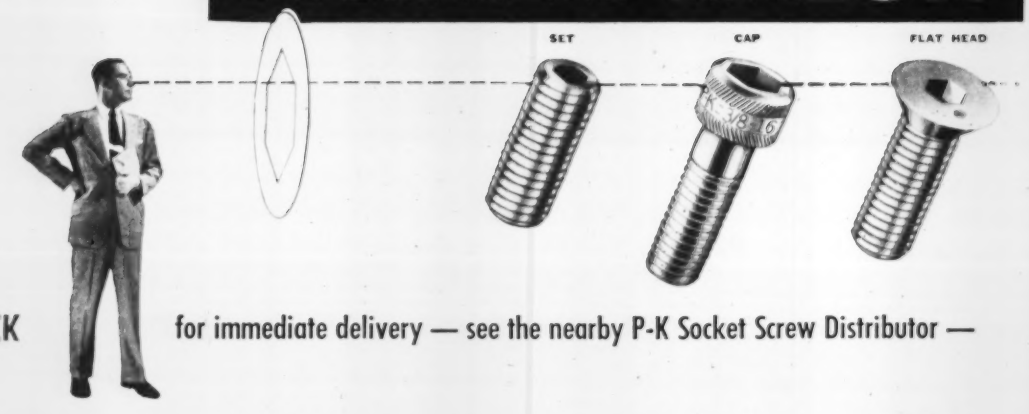

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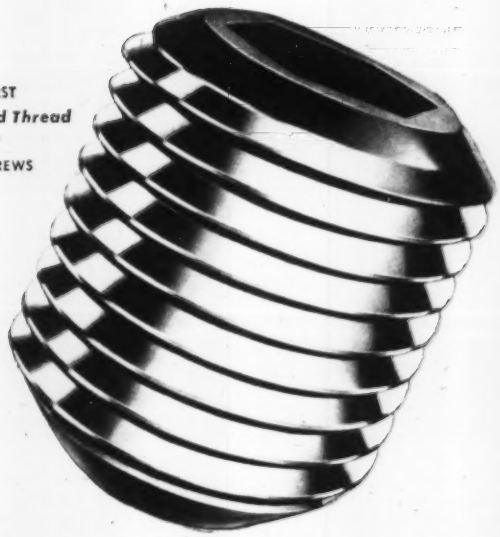

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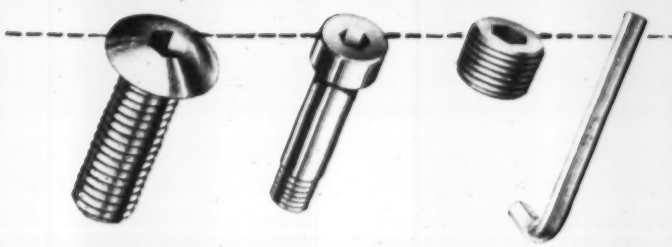

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In Socket Cap Screws PARKER-KALON gives you

• **SIZE-MARK** — offered only by P-K. Incised on the head of each screw, it saves time and wasted screws when sizes get mixed up, prevents errors by green help. Maintenance and service men like Size-mark, it helps in reassembling.

• **GEAR GRIP** Meshing firmly with finger tips, it prevents slipping and fumbling when hands are oily, speeds starting.

• **MAXIMUM STRENGTH** Head, socket, and threads are accurately formed by Parker-Kalon's cold-pressure process. Steel structure "flows" to conform to all contours, assures maximum strength at points of greatest stress.

In all Socket Screws PARKER-KALON gives you

• **GUARANTEED FIRST QUALITY** Based on tests and inspections at every step in production — an exacting routine of quality control supervised by P-K laboratory Technicians.

• **FULL RANGE OF STYLES AND SIZES** You'll find any Socket Screw you need, NC or NF, in P-K's complete line, and Hex Keys in all sizes, and in several handy sets. Ask your P-K Distributor for the P-K Price List, Catalog, — any information you need. Slide chart Socket Screw Dimension Finder Free.

SHENANGO Centrifugal CASTINGS

... KEY TO SAVINGS

use **SHENANGO BAR STOCK**
for superior quality parts!

If you are looking for a superior bar stock, Shenango tubular and solid stock is for you! Shenango Meehanite Metal bars have exceptionally fine grain, higher tensile strength, finer, more uniform graphite dispersion. So naturally you can count on superior wear-life, and less chance of breakage or distortion in service.

Learn more about the money-saving qualities that make Shenango solid and tubular bar stock a preferred material for bearings, bushings, pump parts, liners, sleeves, gears, dies, gauges, and many other common and special parts. Send for the new Shenango Bar Stock Bulletin No. 152, containing additional information and a list of standard, conveniently stocked sizes.

SHENANGO-PENN MOLD COMPANY
Centrifugal Castings Division
Dover, Ohio
Executive Offices: Pittsburgh, Pa.

SHENANGO

ALL RED BRONZES • MANGANESE BRONZES • ALUMINUM BRONZES
MONEL METAL • NI-RESIST • MEEHANITE® METAL

ton capacity can be approximated.

First Cost — The 50-ton unit would involve a capital expenditure of approximately $500,000; the 125, $850,000; and the 300, $1.4 million. These figures include the complete plant in running order, comprising production and ancillary equipment, a gasholder for two hours' capacity at full load, a transformer, buildings and foundations. It would not include such things as spares, cost of land and drainage.

Power consumption is of the order of 430, 410 and 400 kwh per ton respectively, for the three sizes of plants mentioned. These figures include transformer losses and may be higher than those frequently given in technical literature, but they are average rather than ideal figures, so they should be more accurate.

Manufacturing Costs — Assuming the power cost at 0.88 cent per kwh and including all general operating expenses of labor, supervision, maintenance, miscellaneous materials and factory overheads, the average manufacturing costs will figure very close to those in the accompanying table.

Depreciation has been calculated at 10 per cent per annum of the total initial capital outlay, and gross financial charges have also been calculated at 10 per cent of the initial outlay.

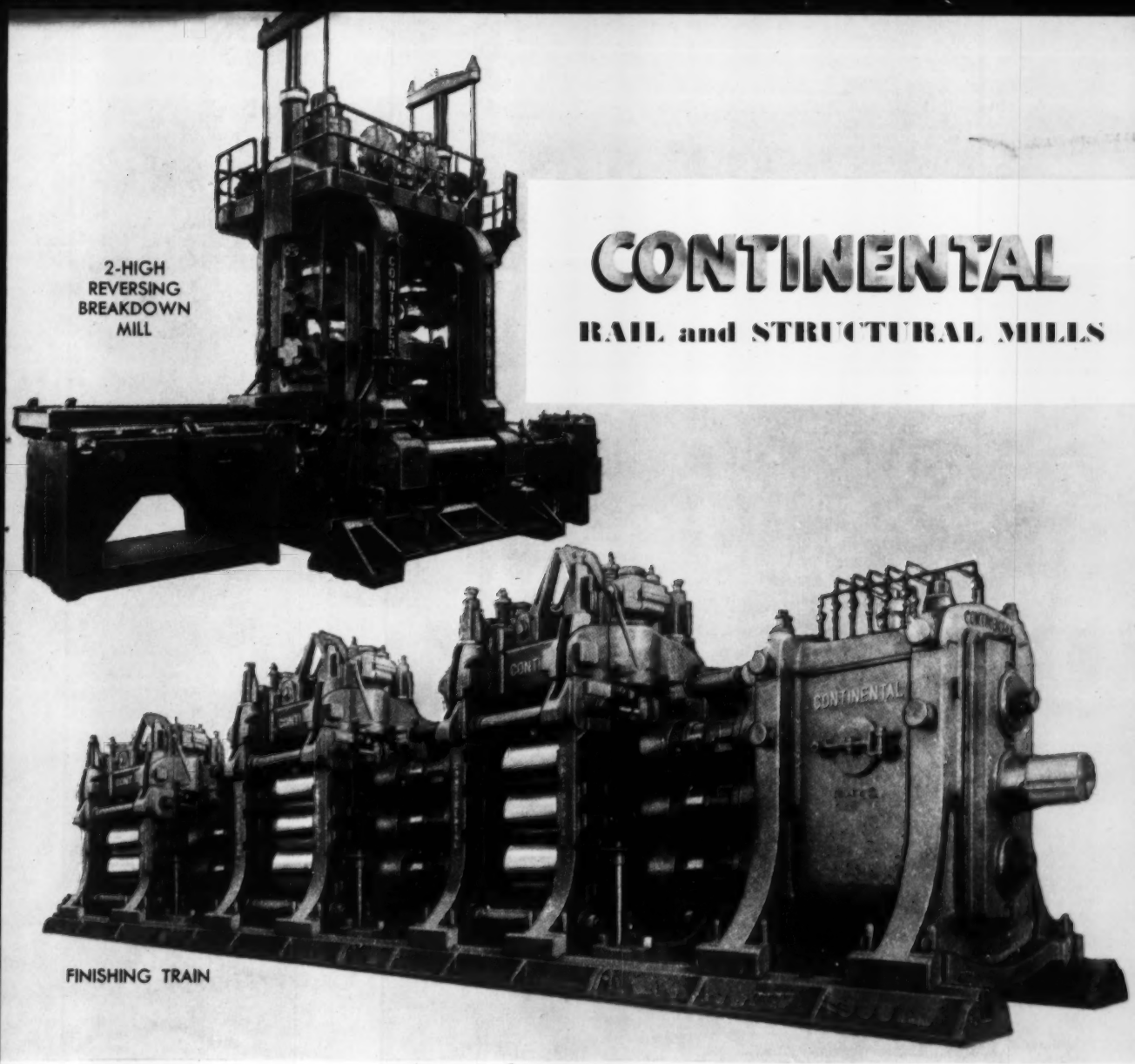
Some Variations—Above figures are based on specific assumptions that there will be some variations from case to case, according to conditions existing at individual works. Some that may affect the cost are:

Purity—average purity of 90 to 98 per cent may be obtained at approximately the same cost.

Transmission Cost—location of the oxygen plant in relation to the site of the melting shop or blast furnace where the oxygen is to be used will be a major consideration in cost of necessary pipeline.

Output—it has been assumed that plants will be running continuously at 80 per cent capacity; any variations will affect operating cost.

From a paper by M. Sykes, Iron and Coal Trades Review, March '53, London, England



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Complete Rolling Mill Installations

SLABBING MILLS	Mills complete with Auxiliary Equipment	BLOOMING MILLS
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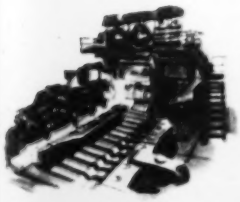
HOT STRIP MILLS	CONTINENTAL CHIPPER	BILLET MILLS
COLD STRIP MILLS	ROLL LATHES	ROD MILLS
TEMPER MILLS	SPECIAL MACHINERY	MERCHANT MILLS

CASTINGS — carbon and alloy steel from 25 to 300,000 pounds

ROLLS — iron, alloy iron and steel rolls for all types of rolling mills

WELDMENTS — fabricated steel plate or cast-weld design



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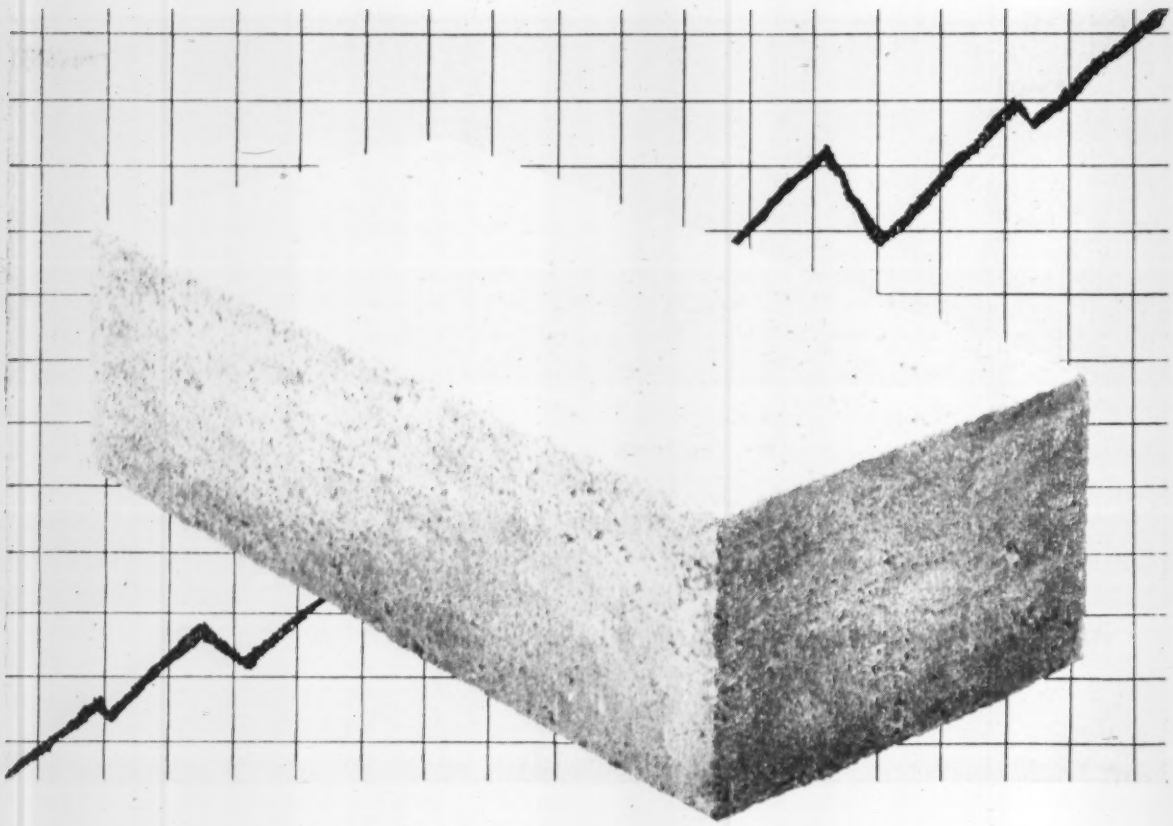


INCREASE YOUR OPEN HEARTH BOTTOM LIFE

WITH PERMANENTE PERICLASE BRICK!

WITH Permanente Periclase "D" burned brick as the subhearth under a Permanente 165 bottom you get *higher MgO per unit volume than possible with any other refractories available today.*

Permanente Periclase "D" bricks provide 9.43 lbs. of MgO per 9" equivalent, plus *maximum* density with absence of connected voids. Used in combination with Permanente 165 you are sure of the ultimate in bottom safety and durability.

Write for descriptive literature on (1) Permanente Refractory Brick, (2) Permanente 165, and (3) the companion ramming mix, Permanente 84.

Principal sales office: Chemical Division, Kaiser Aluminum & Chemical Sales, Inc., First National Tower, Akron 8, Ohio.

Permanente Periclase Brick for the Steel Industry:

PD-B (Periclase "D" burned) brick for open hearth and electric furnace bottoms. Low in iron, lime and silica. Chrome free. Maximum MgO in bottom.

PCA, PCA-MC (Periclase-Chrome "A"), plain and metal-encased for open hearth end walls, front walls and uptakes. Metal-encased for electric furnace sidewalls. High in MgO. Outstanding all-purpose refractory.

CPA-B (Chrome-Periclase "A," burned) for open hearth front and back walls. Controlled chrome additives result in highest resistance to spalling.

CPA-MC (Chrome-Periclase "A"), metal-encased for open hearth back walls, front walls. **D** (Chrome "D" burned) for open hearth bottoms, soaking pits. High hot load strength.

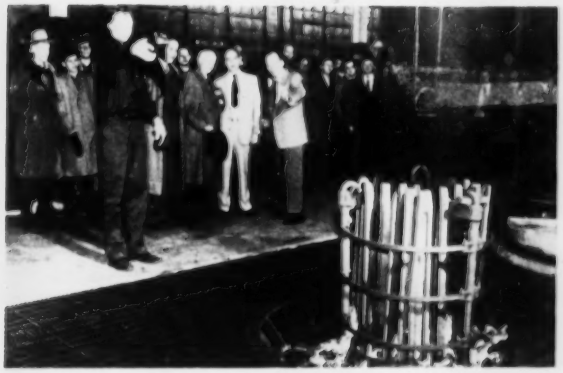
Installation advice on request

Kaiser Chemicals

Producers of the most complete line of basic refractories

BASIC REFRACTORY BRICK AND RAMMING MATERIALS • CASTABLES AND MORTARS • MAGNESITE • PERICLASE • DEADBURNED DOLOMITE

Metalworking executives got a chance to look over the new facilities when the plant went into operation. Here they get lowdown on radiant tube, atmosphere furnace



Each furnace has its quench tank immediately adjacent. Here a fixture of steel flaps for a B-47 bomber is immersed in an oil quench tank installed in the pit

Heat Treat Plant Boasts Versatility

Multi-million dollar job shop in Minneapolis is equipped to perform practically any operation on both ferrous and nonferrous parts. Pit mounting speeds work flow

MODERN heat treating has come to the North Central states in a big way. Recent opening of the new job shop treating plant of Metallurgical Inc., Minneapolis, puts the latest techniques and equipment within reach of a rapidly-expanding metalworking market.

Big feature of the new plant is the floor-level operation made possible by pit-mounting most of the equipment. There are actually two pits; one is 100 x 14 x 15-feet deep, the other somewhat smaller. In them are mounted the furnaces and quenches necessary to treat almost any type of ferrous or nonferrous part.

Big Pit—Housed in the big pit is a Hevi-Duty electric furnace with a capacity of 6700 pounds per load, used for bright annealing, normalizing and carburizing. Two Surface Combustion radiant tube-gas furnaces with capacities of 4300 pounds are also in the pit. They each have oil quench tanks adjacent to them.

Completing the equipment in the pit are an atmosphere-controlled Electric Furnace (4100 pounds capacity) and a Lindberg tempering furnace for tempering and drawing parts that have been hardened in other pit furnaces. Latter is also used for solution heat treating of large aluminum parts, and a large water tank is adjacent for the aluminum quenching. All furnaces and quench tanks in the pit are controlled by chart-type instruments.

Smaller Pit—Arranged in the smaller pit are the furnaces for treating metals for specific hardening and tempering. One of these, a Leeds & Northrup Microcarb furnace is used for carbon restoration. Rest of the pit is taken up by a water quench tank and four Lindberg Cyclone draw furnaces for drawing and tempering steel and aluminum parts. One furnace is used only for heat treating various magnesium alloys.

New plant also features a host of other treating equipment that doesn't lend itself to pit mounting. One such line is headed by three Ipsen furnaces for completely automatic carbonitriding, gas carburizing, annealing and normalizing. Heating and quenching are both incorporated within the furnaces. Next in line are two pusher-type brazing furnaces, gas-fired and atmosphere-controlled for bright annealing, normalizing and air hardening tool steels.

Belt-Type Brazers—Next to the push-type brazers are GE and Sergaent & Wilbur continuous belt-type furnaces for copper brazing, silver soldering, bright annealing and hardening. The S & W furnace operates with a dissociated ammonia atmosphere and the GE unit operates with neutralene atmosphere.

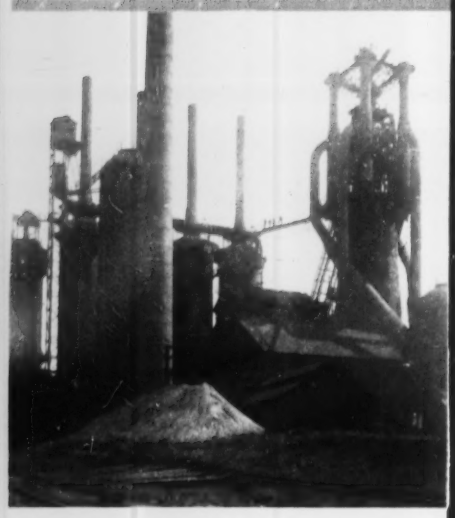
For selective hardening, Metallurgical uses a Cincinnati Flamatic machine. Part to be treated rotates between the gas flame head which heats only the area to be hardened. Selective hardening, annealing and brazing are also done with two induction units, one a single-station type and the other a two-station unit.

Salt Baths—There are also six salt bath furnaces. Two have neutral baths for hardening tool steels and alloy steels, and two have isothermal quenches for martempering and austempering in a range of 275 F to 1100 F. The other two furnaces are Ajax liquid carburizing salt baths for producing surface hardness in steel parts.

One whole section of the plant is devoted exclusively to aluminum heat treating. Solution heat treating is done in two salt bath furnaces, followed by a water quench.

Control Your Corrosion Costs

Materials are available to cut industry's multi-billion dollar corrosion bill. Fast identification of the trouble, correct inhibitor application guarantee impressive savings



By L. R. HONNAKER
Supervisor, Engineering Consultants
E. I. DuPont de Nemours & Co.
Wilmington, Del.

From a paper, "Corrosion Control and Prevention," presented by Mr. Honnaker at the recent Plant Maintenance & Engineering Conference.

The Case for Protection

DIRECT cost of corrosion to American industry amounts to several billion dollars annually. An even greater sum may be involved in the hidden cost, if it is considered that in many instances value of lost time incidental with equipment repairs or replacements is greater than maintenance costs.

Today, manufacturing steps are highly integrated and techniques largely have changed from batch to continuous operations. Thus practically none of the equipment can be out of service for repairs or replacement without curtailing production seriously.

Better-known forms of corrosive attack on metals overlap and may not always be well defined. In some instances, several forms of corrosion are known to occur simultaneously.

Nonmetallics—There are almost as many nonmetallic materials as there are metals and alloys, and their use has provided economical solutions to many difficult corrosion problems.

Metallic contamination has become an important consideration, in some cases a limitation, in use of metals for equipment for processing or handling products where quality is lowered by such contamination. Application of nonmetallic materials, in particular the plastics and elastomers, proves extremely attractive for avoiding metallic contamination as well as corrosion. Use of these materials is limited to relatively low pressure and service temperatures—about 150 to 250°F, depending on material and chemical exposure involved.

Several types of plastics are being accepted as economical im-

FORMS OF METAL CORROSION

General Corrosion	Thinning or loss of metal is not accompanied by any definite manifestation of pitting, cracking, erosion, etc. Inhibitors frequently will minimize general corrosion. Where necessary, metals with higher corrosion resistance or other materials of construction can be used.
Pitting	Electrochemical action results in metal loss at anodic areas. General corrosion frequently is slight even in instances where metal perforation occurs as a result of pitting type corrosion. Notable examples: Pitting of stainless steel and aluminum in environments containing chlorides. Use of inhibitors is effective in minimizing pitting in many environments. Design considerations are often important.
Stress Corrosion Cracking	Cracking occurs as result of combined effects of static stresses and corrosion, generally without noticeable metal loss. Typical examples: Seam cracking of cold-formed or worked brass in atmospheres containing ammonia, and cracking of the austenitic stainless alloys in presence of chlorides.
Caustic Embrittlement	Similar to stress corrosion cracking, but limited to conditions where caustic is involved. Most common occurrence is failure by cracking of carbon steel when it is used in as-welded condition for handling caustic solutions above room temperature.
Galvanic Corrosion	More noble of two metals in contact with an electrolyte causes electrochemical attack of the less noble metal. Best example: Use of zinc to protect steel and aluminum equipment. Galvanic protection is achieved as a result of sacrificial zinc corrosion.
Hydrogen Embrittlement and Attack	Hydrogen generated by contact with process solutions enters metal and causes loss of ductility, microcracking and blistering. Aqueous hydrogen sulphide frequently causes failure of steel equipment as the result of such effects.
Crevice Corrosion	Localized attack occurs on surfaces partially shielded from contact with corroding medium. This also includes concentration cell and differential aeration effects.

provements over metals for some corrosive conditions. Notable are polyethylene, polyester - Fiberglas, styrene-synthetic rubber blends and unplasticized polyvinyl chloride. All are available as piping, sheet stock and miscellaneous fabricated equipment items. A point of merit that should not be overlooked in considering over-all cost: Plastic equipment requires no painting for external corrosion protection.

Rubber Lining Compounds—Excellent progress has been made for developing rubber lining compounds, both natural and synthetic, for corrosive service applications. Rubber linings are particularly attractive for use where abrasive as well as corrosive conditions are involved.

Upper temperature limitation for rubber lining is 160 to 200 F, depending on rubber compound and chemicals involved. Rubber linings are used frequently in combination with brick where processing temperature conditions are above the limit for rubber. Several compounds are available which may be applied easily and almost all can be readily and adequately repaired in the plant.

A development that has done much to improve serviceability of rubber linings is the spark test, devised to detect pinholes in linings and joints or seams. Value of spark tests is now recognized by most fabricators and it can and should be made a condition of order or acceptance.

Protective Coatings—It is now generally agreed that a good protective coating job is dependent on three fundamentals: Proper surface preparation, coating selection and application. Compromise in any of the three will seriously jeopardize chances of obtaining a good protective coating job.

Most studies on surface preparation indicate that sandblasting is the best method. It is always wise to remove mill scale from new steel. Recontamination after cleaning, and before coating, should be avoided.

Coating selection should be based on type and severity of exposure. This should not present any serious selection problem in most instances, because hundreds of coating systems are available, comprising about 14 general types. At least one is able to resist almost any given set of corrosive conditions. The real problem is that coatings have serious physical limitations, such as porosity, low strength and brittleness.

Coating Application — Last of the three fundamentals—application generally is considered the most important. Even if surface preparation is excellent and coating film adequate, premature failure will occur if it is not applied properly. Chief problem: Freedom from pinholes and holidays.

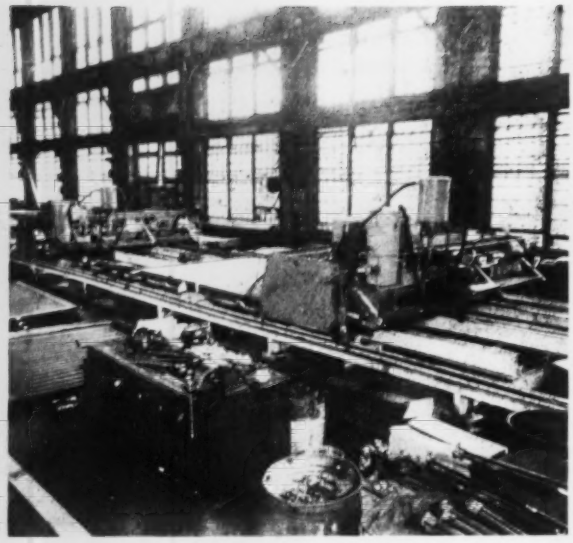
In most cases, the best way to assure good coverage over surface roughness, sharp edges and corners is to apply multiple coats or passes to a dry film thickness at least three times the profile depth of the surface roughness. Observance of requirements for adequate thickness will probably do more to assure good coating life than any other single factor.

Minimum desired dry film thickness in almost all cases is 5 to 6 mils. Much success of the fibrated mastic type coating in severe industrial atmosphere exposure is undoubtedly due to good coverage over rough areas, corners, and relative absence of porosity. These coatings are sprayed on to about 1/8-inch thickness and spark tested.

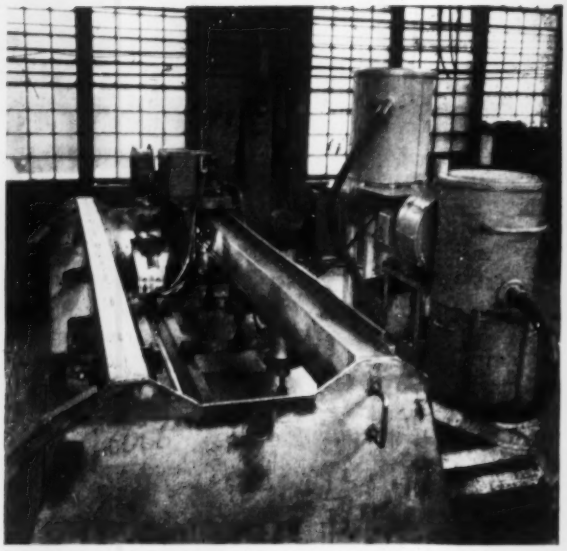
Personnel Approach—The best possible approach, if not the answer, to industrial corrosion problems is to assign personnel to corrosion engineering work. Their background in corrosion knowledge should include corrosive characteristics of chemicals as well as resisting characteristics of materials. They should become familiar with physical and mechanical properties of materials of construction, get information on availability and cost of these materials and know fabricating techniques and limitations.

AND THEIR CHARACTERISTICS

Intergranular Corrosion	Attack is concentrated at grain boundaries without appreciable general corrosion. Failures are relatively infrequent today and further improvement will come as a result of using stabilized or low carbon grades of the austenitic stainless alloys.
Dezincification	Zinc constituent in brasses is selectively removed, leaving sponge copper behind in essentially the original shape and volume of the unattacked piece. Effect is limited generally to brass compositions containing more than 15 per cent zinc. Additions of small amounts of arsenic, antimony and tellurium to the metal generally will minimize, if not prevent, this form of corrosion in brass.
Graphitization	Galvanic corrosion occurs between graphitic and iron constituents in cast iron, with resulting formation of spongy mass of corrosion products. Original shape and volume are generally retained. Low alloy cast iron materials are relatively immune to this form of corrosion.
Erosion Corrosion	Effects of velocity remove protective films and cause increased corrosion rate. This is most likely to occur in liquid systems which contain solids.
Impingement	Similar to erosion-corrosion, but solids generally are not involved and specific effects are more localized. Most common occurrence: Near the inlet ends in nonferrous alloy condenser tubes. Reduction in velocity or turbulence will minimize this difficulty.
Fretting Corrosion	Corrosion is accelerated by mechanical removal of films or corrosion products. This form is confined generally to machine parts with small relative motions and high unit loads.
Oxidation	Metal oxides are formed by direct chemical reaction and losses occur as scaling, generally at elevated temperatures.
Sulphidation	Sulphur-bearing atmospheres cause intergranular attack at elevated temperatures. This is limited for the most part to alloys of high nickel content.



Two welding carriages operate simultaneously in making welds along vertical seams in side panels. Stock is 15 gage and seams are nine feet long. Penetration is good



Sheets are first tack welded and held down firmly close to seam by pneumatic bars. The automatic welding head moves across the seam at 70 ipm, shielding arc with flux

Hidden Arc Speeds Sheet Section Welding

Machines lay down sound, uniform welds at speeds of 70 ipm. Fast metal deposition minimizes the sheet warpage on railroad car body sections, PRR finds

GREATEST stimulus to the use of arc welding on thin sheet sections making up the outer walls of railroad cars has been the perfection of automatic submerged or hidden arc welding heads which can traverse lengthy seams at speeds of 70 ipm or better.

Welds have good penetration, uniformity and soundness, and speed of metal deposition means minimum of warpage in the sheet members and, being nearly flush with the steel surface, the welds require little finish grinding before painting. That's the report from the Pennsylvania Railroad's car building and repair center at Altoona, Pa., which boasts some 1300 trained welders on the job.

Some Examples—Typical is the automatic hidden arc welding of box car side sheets. Cars are 50 feet long, weigh 47,200 pounds, have a load limit of 121,800 pounds and are of all-welded construction. Sides are 15 gage (0.0673 inch thick) high tensile steel sheets, 48 inches wide, joined together at every other side post and fusion welded to the intermediate post.

Setup for machine welding consists of a Lincoln LAF-2 head mounted on a special carriage traveling on tracks outside the I-beam jig on which the sheets are positioned after first being tack welded. The carriage has two main beams, to each of which are attached three air cylinders actuating segmented hold-down bars. Before a weld is started, the bars are forced down against the sheets immediately next to the seam to hold it perfectly flat.

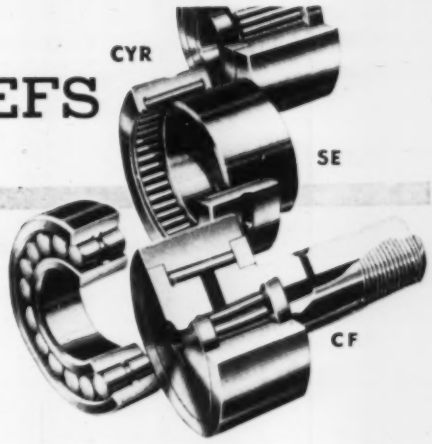
Little Warpage—Combination of high current, high travel speed and the flux protected weld, along with the hold-down device on the carriage, results in a minimum of warpage in the sheets. When installed, the side sheets are backed by vertical Z-section posts, spaced 24 inches apart, forming a girder car side.

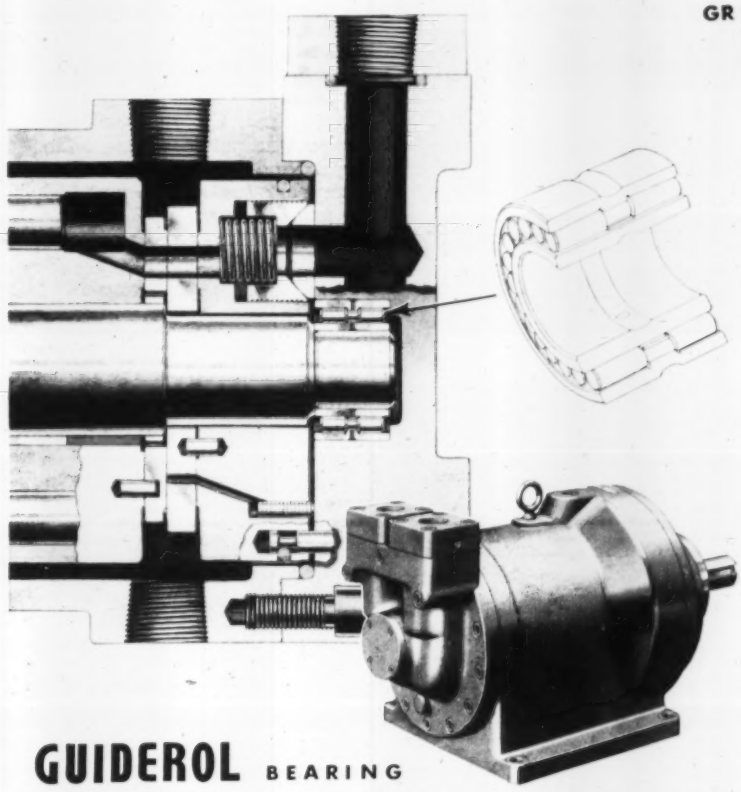
Tracks on which the welding carriages travel are continuous and allow the carriages to run beyond the assembled side sheets. A crane moves the finished section to the car assembly point, where it is set on the welded underframe. The two top chord members, forming juncture between roof and side sheets, comprise two 50-foot specially-shaped sections of 3/16-inch plate, having two opposite joints fillet welded throughout their entire length by automatic welding.

Corrugated end sections for the car are formed in two halves; the bottom half is 11/64 inch thick and the top half 9/14 inch thick, automatically welded across the center on the outside only, using the same type of jig and welding carriage as that employed for the side sheets.

(Advertisement)

McGILL BEARING BRIEFS





GUIDEROL BEARING

used in pilot model Oilgear Motor

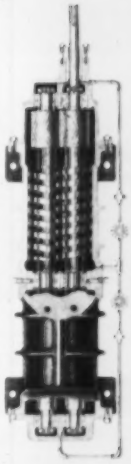
SHOWS NO WEAR AFTER 4000 HOUR TEST

The Oilgear Company, Milwaukee, Wisconsin, a regular McGill bearing user, has been testing a pilot model of a new 60 HP Axial Type Hydraulic Motor equipped with Guiderol Bearings for over a year. After 4000 hours of full load operation, the Guiderol Bearing used on the pilot end of the motor shaft was removed and inspected. It was still in perfect condition showing no internal wear.

This new line of lighter and faster operating axial piston units take advantage of the Guiderol bearing's assured freedom from skewing and extra load capacity in reduced radial bearing space.

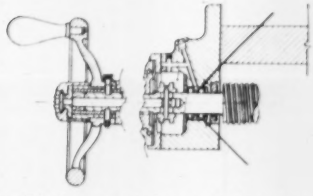
Mr. Ernst Wiedmann, Oilgear Chief Engineer, is enthusiastic about the performance of the Guiderol Bearings. He says: "They are the best full-type roller bearings for our hydraulic pumps and motors." As a result he is changing old specifications for this type of bearing to Guiderol and including Guiderol Bearings on all new developments.

WARREN-QUIMBY ADOPTS GR BEARINGS FOR MAXIMUM RADIAL LOADS



Warren Steam Pump Company has adopted Guiderol Bearings at five points of maximum radial load in this Warren - Quimby Vertical Screw Pump. The Guiderol Bearings have more load carrying capacity in the limited space available and enable vertical mounting of the pump without roller skewing or locking.

KEARNEY & TRECKER FINDS LIFE FACTOR INCREASED IN TABLE FEED APPLICATION



The life factor of the shaft bearing on the table feed screw of Kearney & Trecker Milling Machines has been increased by the simple process of changing to Guiderol Bearings. These bearings increased capacity, performance and bearing life.

BEARING SELECTION GUIDE
A new 140-page Bearing Selection Guide, complete with 30 pages of vital engineering data, has been released by the McGill Manufacturing Co. Ask for Catalog No. 52.

McGILL® — **Precision Bearings**
McGILL MANUFACTURING COMPANY, INC.
301 N. Lafayette Street, Valparaiso, Indiana

BIG

MANIPULATOR

Alliance MANIPULATOR

INCREASES PRODUCTION FROM 200 TO 400%

This 75-ton Alliance Manipulator is the world's biggest. It handles ingots for ship shaftings . . . press columns, large naval gun barrels and other huge jobs.

At the International Nickel Company plant in Huntington, West Virginia, two 4-ton straight line Alliance Manipulators serve a single hammer . . . forging Monel metal ingots from 14"x14" down to 8"x8". They helped boost 8 hours' production to 250% of the former record capacity with less than half the number of men.

Alliance builds forging manipulators in capacities from 1 to 75 tons in the following types . . . straight line trolley only, straight line trolley with bridge, sluing trolley type, sluing trolley type with bridge and crane type. Some bridge type manipulators handle the entire job—charging, forging, discharging and delivering.

Users of Alliance Machine Company Manipulators report 200 to 400% increased production with a smaller crew.

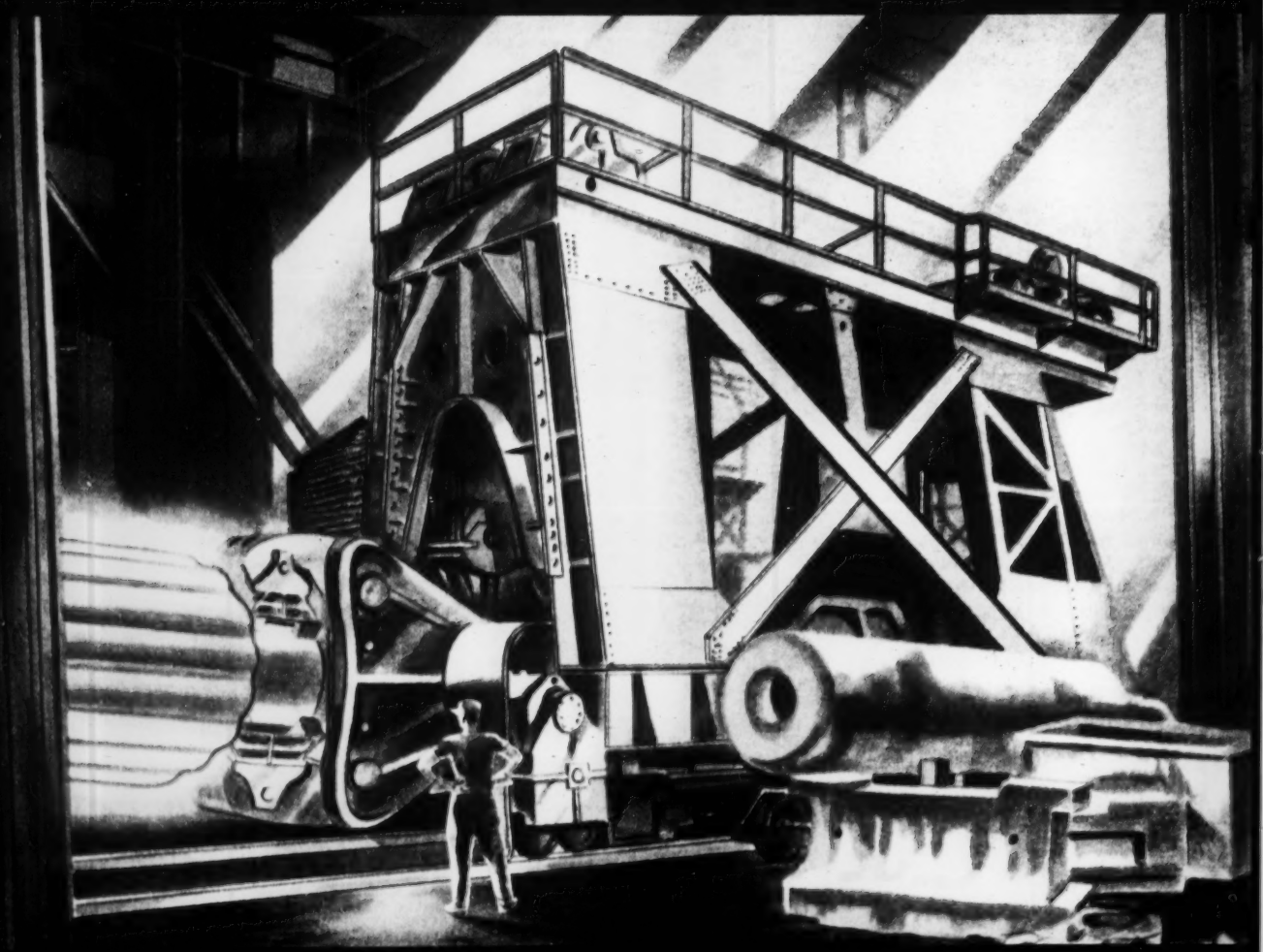
If you are not using Alliance Manipulators now, you can increase production and save money by writing us today.

THE *Alliance* MACHINE COMPANY

Main Office: Alliance, Ohio

LADLE CRANES · GANTRY CRANES · FORGING MANIPULATORS · SOAKING PIT CRANES
STRIPPER CRANES · SLAB AND BILLET CHARGING MACHINES : OPEN HEARTH CHARGING MACHINES · SPECIAL MILL MACHINERY · STRUCTURAL FABRICATION · COKE PUSHERS

Give Us The Runway And We'll Lift The World



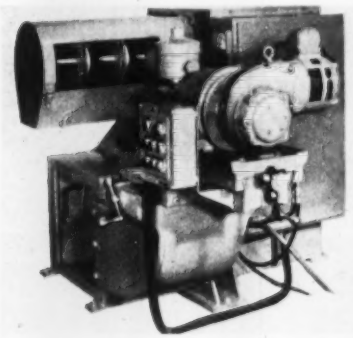
NEW PRODUCTS and equipment

Reply card on page 125 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Brushing Machine

. . . works up to 100 pounds

Brushamatic 4-L3 was recently added to the line of Osborn's brushing machines to handle metallic or non-metallic components up to



100 pounds in weight. Rugged in design, the workholder is integral with the brushing lathe, thus providing a fixed relation between brush and work to be brushed.

The job of the operator is placing the work piece on the work holding fixture. Once this is done, his job is complete until the work is brushed and ready to be removed. The brushed work is removed, another unfinished work piece placed on the work holding fixture, and so on. A pre-set timer retracts the brushing heads and motion is stopped until again actuated by the operator. Osborn Mfg. Co.

FOR MORE DATA CIRCLE NO. 1 ON REPLY CARD

Motorized Card File

. . . completely automatic

The Simplafind motorized card file is completely automatic and pushbutton controlled. The file is quickly positioned in any desired section of records. When the operator pushes a button on the machine, the machine automatically selects the shortest direction of rotation, and the only action on the part of the operator is the selection of the correct button and the selecting of the particular card wanted.

Individual machine capacities go as high as 200,000 or 300,000 standard sized cards per unit, and the unit is small enough so that one operator can conveniently use two or three machines at one time. Simplafind is available in a wide

range of machine sizes for standard and many special sizes of office records. Wheeldex & Simpla Products Inc.

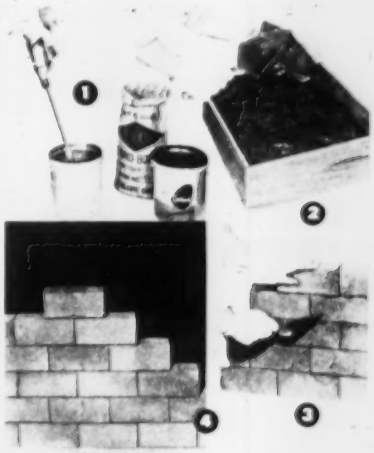
FOR MORE DATA CIRCLE NO. 2 ON REPLY CARD

Resin Bonding Cement

. . . resists corrosion

A new bonding material, developed by Ceilcote, resists the corrosive effects of acids, alkalis and solvents. Chief advantages of Corobond resin cement is its superior workability and longer pot life providing a greater working time prior to initial set, regardless of temperature. A mixing of acid hardeners, acting on a delayed reaction principle, slows the initial hardening of Corobond and allows ample working time when large batches are mixed.

The cement is designed to eliminate the disagreeable factors ordinarily inherent in resin cements



and also to assure complete adherence to the building material. Corobond can be spread easily and pressed evenly into a tight joint without excessive pressure. Bricks do not slip or slide; extruded cement is neatly sliced off, leaving surface clean. Ceilcote Co.

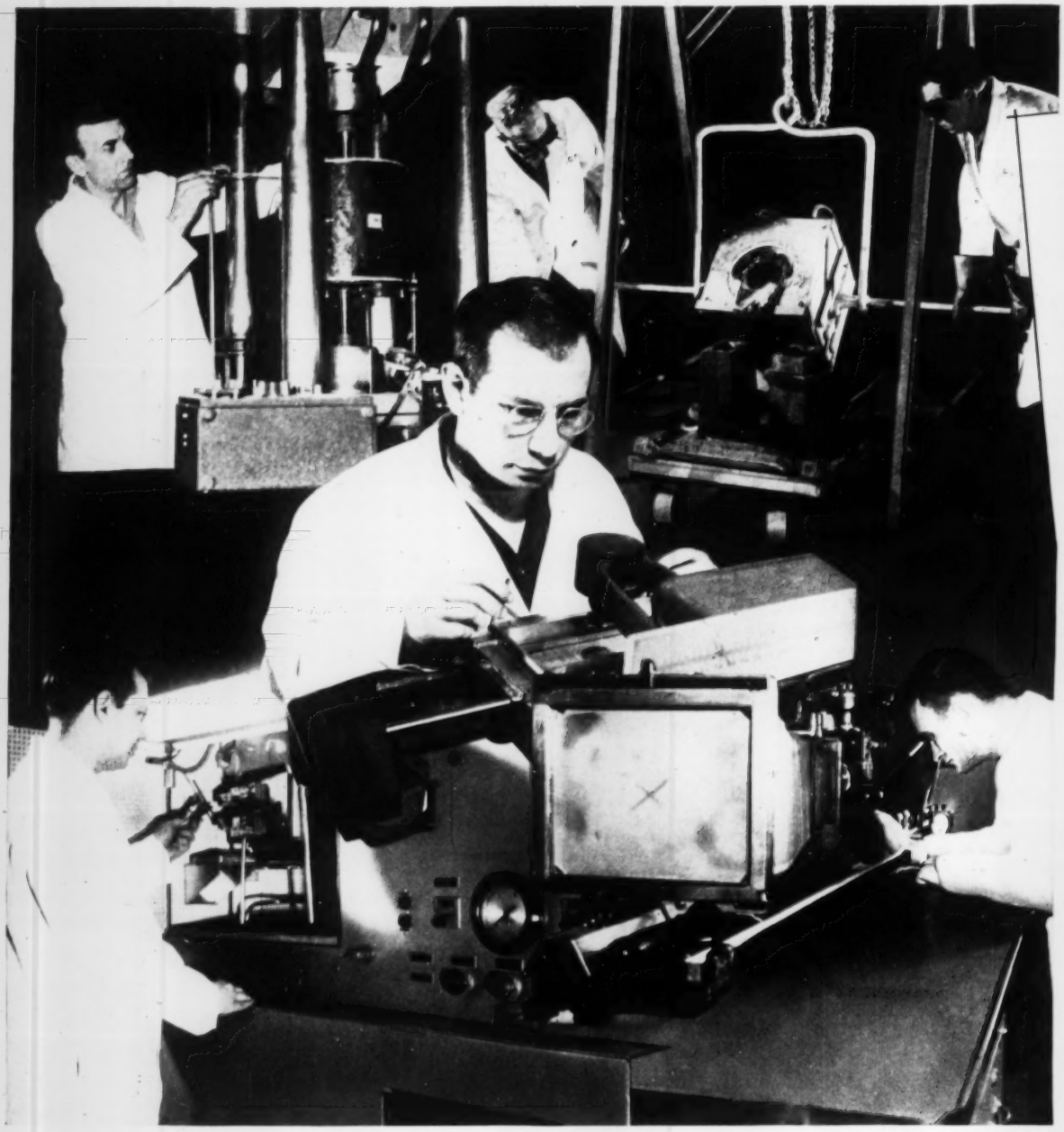
FOR MORE DATA CIRCLE NO. 3 ON REPLY CARD

Radiation Gage

. . . for close quarters mounting

Industrial Nucleonics Corp. has designed an AccuRay radiation gage to measure the thickness of strip on small, compact cold reduction mills.

For close-quarters mounting, the new unit is 10½ inches in height, 4½ inches wide and 26 inches long. Like its predecessors, it features an automatic



Scientists and engineers at the new VCA Research Center—working with complete, modern facilities for metallurgical research of every type—stand ready to help you find solutions to your most difficult technical problems.

VANCORAM
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Producers of alloys, metals and chemicals

Initial building of the new Vanadium Corporation Research Center at Cambridge, Ohio.

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PRESIDENT

An important message to the metals industry

On December 1, 1953, Vanadium Corporation of America opened at Cambridge, Ohio, the initial building of its new Research Center.

The new Center is dedicated to just one end: to help you develop and produce ever better, ever more versatile metals through helping you find new, practical solutions to your most difficult technical problems.

To achieve that end, we have made the new Center what we believe to be one of the finest of its type anywhere in the metals industry.

We have made it a living symbol of the traditions, the achievements, the ultimate goals shared by Vanadium Corporation and the metals industry as a whole — as well as a new means to future service and prosperity for both.

We cordially invite you to visit our new Research Center next time you are in the vicinity.

President
Vanadium Corporation of America

standardization cycle which periodically enables the gage to compensate for error-producing variables such as changes in temperature, humidity and dust collection on the radiation window. With this feature operating personnel do not need to insert standard

samples and adjust dials to manually standardize the gage. The AccuRay recording console is also offered with this model. Industrial Nucleonics Corp.

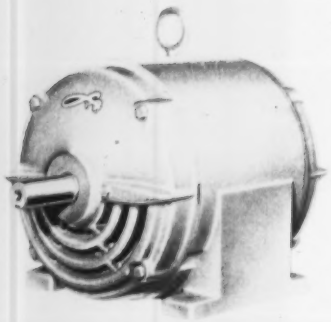
FOR MORE DATA CIRCLE NO. 4 ON REPLY CARD

Redesigned Motor Line

. . . redesigned to NEMA specs

Louis-Allis announces a redesigned motor line to meet the new NEMA standards.

Their line of electric motors in open drip-proof, totally-enclosed fan-cooled and explosion-proof enclosures in ratings up to 40-hp at



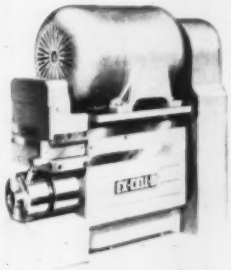
3600 rpm incorporates these new features: Improved ventilation; greater protection; new conduit box arrangement; new bearing construction; more versatile mounting. Louis Allis Co.

FOR MORE DATA CIRCLE NO. 5 ON REPLY CARD

Hydraulic Power Unit

. . . actuates single, multiple head

A quill-type hydraulic power unit has an 8-inch stroke. Like other Ex-Cell-O units it is self-contained, compact, hydraulically operated and designed for actuating a single tool or multiple



spindle head in easily controlled automatic cycles. Ex-Cell-O Corp.

FOR MORE DATA CIRCLE NO. 6 ON REPLY CARD

Precision Flow Gun

. . . for sealing compounds

Increased efficiency in flowing sealing compounds such as asphalt, rubber cement and similar heavy materials is promised with Binks' new precision flow gun, model 31. It can also be used to seal gaskets, moldings, cracks, corners and crevices on auto bodies, refrigerators and other products. No atomizing

air is used. The material is forced from a material tank or pumped by one of the many types of material handling pumps.

A selection of sixteen nozzles with orifices of various sizes and shapes for many types of work is offered. A special model of this new gun, designated 31V, for use in applying abrasive materials in the ceramic field, is also available. Binks Mfg. Co.

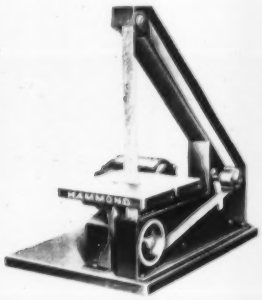
FOR MORE DATA CIRCLE NO. 7 ON REPLY CARD

Abrasive Belt

. . . has 10½-inch throat depth

A 1-inch flexible abrasive belt grinder-polisher has been added to Hammond's line of abrasive belt machines.

The model F-1 is designed to be used in deburring, grinding and polishing operations. The 10½-inch throat depth permits finishing of hard-to-get-at areas. Features included are: Work table and belt platen permit accurate grinding of flat surfaces; irregular contours can be ground on a free belt by removing the platen and work table. It is available as



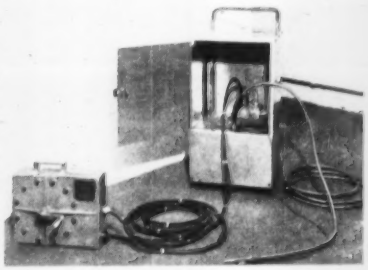
either bench or floor model and with built-in dust collector. Hammond Machinery Builders Inc.

FOR MORE DATA CIRCLE NO. 8 ON REPLY CARD

Radiographic Equipment

. . . makes for safe handling

A Panoramic exposure shield for use in cobalt 60 radiography was developed to permit the safe handling of strong radioactive sources for three specific requirements: Exposure in internal locations;



radiography where electric power is not available; panoramic exposures. Technical Operations Inc.

FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

Automatic Press

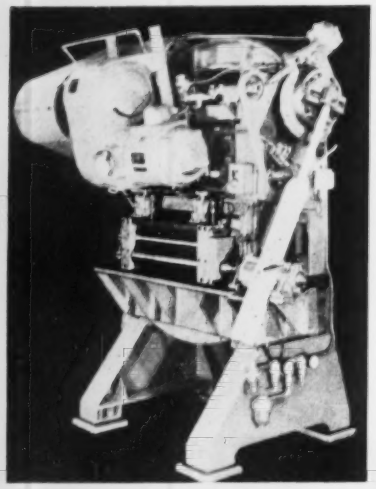
. . . aligns perfectly

Stock up to 23 inches wide can be stamped on the Diebel 40-ton automatic press with back-to-front feed. Use of air cylinders to clamp stock assures positive feeding without distortion of soft metals. Length of feed is infinitely variable from zero to thirteen inches.

The ram will align punch and

DEEP DRAWS
That highly desirable characteristic—the ability to take deep draws and intricate shapes without wrinkling or splitting—is one that you'll find in Weirton hot-rolled strip steel.
Careful control from mine through mill, and the use of the most up-to-date equipment and techniques, are what give Weirton hot-rolled strip steels the qualities that deliver the desired results under the most exacting conditions.
Next time you have a design that calls for a hot-rolled strip that can easily take deep draws—call Weirton and be sure.
hot-rolled strip steel
from
WEIRTON STEEL COMPANY
Weirton, West Virginia
WEIRTON STEEL COMPANY
NATIONAL STEEL CORPORATION

die perfectly. Four bronze bearings support the crankshaft for maximum strength and shaft rigidity. Use of pneumatic clutch



in conjunction with variable-speed motor permits press operation from 72 to 360 strokes per minute. Di Machine Corp.

FOR MORE DATA CIRCLE NO. 10 ON REPLY CARD

One-Ton Chain Hoist

. . . for hazardous areas

This one-ton chain hoist is designed to meet the demand for a non-magnetic, spark-resistant hoist

for use in locations where standard chain hoists constructed of ferrous materials have proved unsuitable.

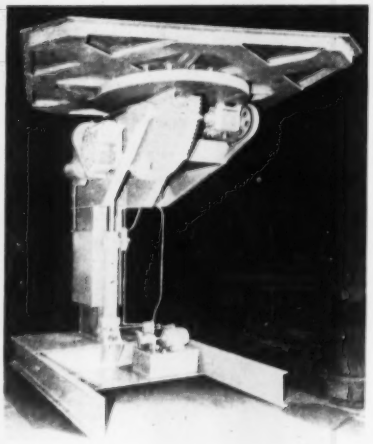
The spur gear, ball bearing type hoist is proof tested at 4,000 pounds and the Ampco hoists are tested to 50 per cent over their capacity. They are recommended for use in hazardous areas where a spark might cause an explosion and where corrosion might result from direct contact with liquid or fumes. The magnetic permeability of the materials of construction is low and they are generally classed as non-magnetic and as a result, the hoists are specified by the Navy for minesweeper service. Ampco Metal Inc.

FOR MORE DATA CIRCLE NO. 11 ON REPLY CARD

Weldment Positioner

. . . is accurate, smooth

This 40,000 pound Pandjiris weldment positioner uses high ratio Cone-Drive speed reducers in the tilting and rotating systems to absorb the high torques that are developed under heavy loads, hold



heavy loads without drifting and transmit power smoothly and accurately to the table.

A 15-hp motor drives the worm gear of the 10-inch center distance speed reducer at 1140 rpm. A 10-hp motor drives a Reeves variable transmission system which in turn provides a variable input to the worm gear of the 7-inch center distance speed reducer. Cone-Drive Gears, division of Michigan Tool Co.

FOR MORE DATA CIRCLE NO. 12 ON REPLY CARD

Hydraulic Surface Grinder

. . . accommodates 6 x 18 chuck

Boyar-Schultz model 6-18 H incorporates the popular features of the hand feed machine including the ground and hardened tool steel bed ways and hand scraped table and column ways. Built to accommodate a 6 x 18 chuck, its actual capacity is 7¼ inches by 19 inches. It takes an 8 x ⅝ or 8 x ¾-inch grinding wheel with a 1¼-inch

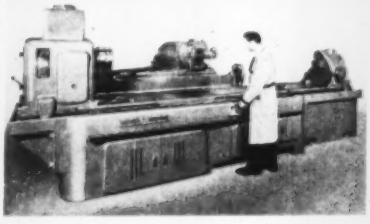
hole. The vertical capacity is 17 inches from the table to the center of the spindle. The machine is said to have an exceedingly smooth stroke, with variations in longitudinal hydraulic feed of 0 to 50 fpm. Boyar-Schultz Corp.

FOR MORE DATA CIRCLE NO. 13 ON REPLY CARD

Gear Shaving Machine

. . . for spur, helical gears

A gear shaving machine that will finish teeth on spur and helical gears up to 36 inches pitch diameter having shafts up to 142 inches long is equipped with a



power driven headstock and a center tailstock, each mounted on base extensions and traversed by rack and pinions for positioning.

Gears up to 2 diametral pitch having face widths up to 36 inches can be finished on the new shaver. Crowning at tooth surfaces on spur

NEW **Tuffy** HOIST LINE

Tuffy SLINGS

with this TuffyTeam You Can Pick Up and Set Down More Loads Longer

Yours For The Asking! 48-page Sling Handbook and Rigger's Manual, containing plenty of useful information! Write for your copy, and complete information on Tuffy Hoist Lines!

Tuffy Slings and Tuffy Hoist Lines have given the industry a team that is setting new performance records every day all along the *materials handling line*. Time after time, users report sling costs greatly reduced . . . hoist line service way up over any other rope!

Special Purpose Construction is the reason for the extra service given by the Tuffy Team! TUFFY SLINGS are made of a patented, 9-part machine braided wire fabric that stays extra flexible. Will not materially damage fabric when kinked or knotted. TUFFY HOIST LINES are designed to give the same flexibility, plus an amazing toughness to absorb load shocks and let Tuffy pass safety checks long after other ropes would be discarded!

See The Difference the Tuffy Team can make in your operating cost on stiff leg, overhead or mobile cranes, derricks or clamshells!

SEE HOW MUCH MORE VALUE A TUFFY DISTRIBUTOR CAN GIVE YOU

For Tuffy Hoist Lines, just give the length, diameter . . . for Tuffy Slings, the diameter, length and any of the sling types shown at left. But always say Tuffy!

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Specialists in High Carbon Wire, Wire Rope and Braided Wire Fabric

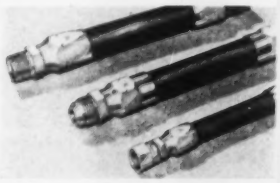
and helical gears up to 12 inches wide having shafts up to 62 inches can also be performed on the machine. National Broach & Machine Co.

FOR MORE DATA CIRCLE NO. 14 ON REPLY CARD

Fitting Line

. . . increased 13 sizes

Parker Appliance has expanded its line of reusable type Hoze-Lok fittings to include 13 additional sizes of the industrial hose couplings.



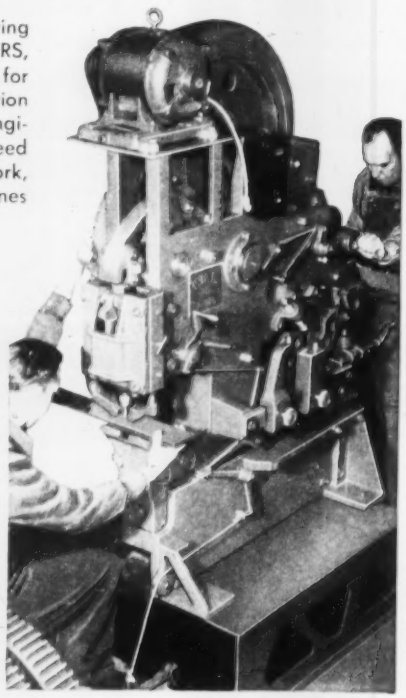
The additions eliminate the need for reducers in many combination size connections when diameter reduction from hose to tubing is desired. The reusability feature means convenient and rapid installation of hydraulic hose lines, ease and simplicity of assembly, providing on-the-spot repairs and lower maintenance costs. The new additions conform to SAE hose fitting standards and applicable specifications of JIC hydraulic standards. Parker Appliance Co.

FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

WEBB PLATE FABRICATING MACHINERY

Steelworkers ALL STEEL CONSTRUCTION

The Webb Corporation, in presenting the line of new WEBB STEELWORKERS, has designed versatile machines for either job-work or high production work. These units have been engineered to meet the particular need of shops having a variety of work, with a result that all-purpose machines are now available.



Five Complete Tools are Incorporated in a Single Unit.

1. Punch for plate, bars or structurals.
2. Cuts angles and tees with straight or miter cut.
3. Cuts off round and square bars.
4. Shears plates and bars.
5. Coping or notching attachment.

One of the main features of these machines is that they are at all times in complete readiness to do any of the above operations and to do the work well.

The punch may be operated at the same time as either the section cutter, bar cutter, shear or the coping and notching attachment . . . therefore, two operators can work at this machine simultaneously without interference. For illustrated literature and prices, write Dept. D.

Let Speed PAY–The WEBB Way!

SLIP ROLLS

PYRAMID TYPE ROLL

INITIAL TYPE ROLL

STEELWORKERS

Also Manufacturers of INDUSTRIAL WEIGHING EQUIPMENT

Since 1881 THE WEBB® CORP.

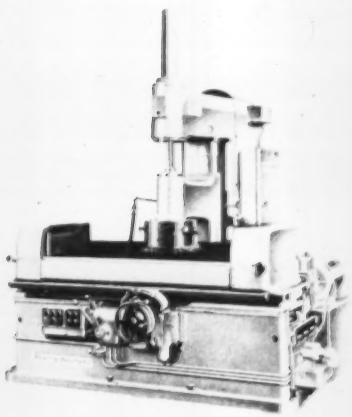
WEBB CITY, MO., U. S. A.

Surface Grinder

. . . with high table speeds

An improved 14-inch hydraulic vertical surface grinder of more rigid design throughout and higher table speeds has been announced by Pratt & Whitney.

The new machine is available in either a 14 x 36-inch or 14 x 60-inch size with solid ring wheel or



17 x 36-inch or 17 x 60-inch size with segmental wheel. The model D has wide wheel-head ways together with an increase in column bearing length. It is powered by a 30-hp motor. Pratt & Whitney, division of Niles-Bement-Pond Co.

FOR MORE DATA CIRCLE NO. 16 ON REPLY CARD

Testing Chamber

. . . automatically tests parts

A testing chamber which automatically cycles test parts through alternate hot and cold temperatures consists of a test chamber 30 inches long by 11 inches wide and 16 inches deep. It produces first a low temperature to −120°F and then raises the temperature to +200 F. It will repeat the cycle as many as 100 times. It is equipped with explosion-proof and

water-proof strip heaters rated at 3500 watts and the automatic programming controls.

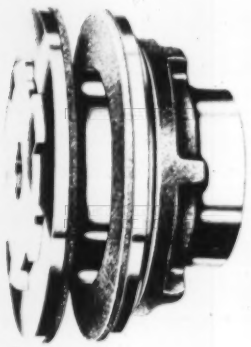
Equipment on the unit includes a 24-hour chart recording thermometer and a 2-inch porthole through which may be run test leads etc. Cincinnati Sub-Zero Products Co.

FOR MORE DATA CIRCLE NO. 17 ON REPLY CARD

Overload Protection

. . . in 11 models

A line of compact, adjustable torque-limiting overload protection devices for a wide variety of machine drives is available from Morse Chain. The Morse Torque Limiters are slip-type friction



clutch devices featuring a powdered metal bushing on which such drive components as chain sprockets, V-belt pulleys or gears can be mounted. Eleven standard models giving maximum torque capacities from 20 to 620 foot-pounds can be had. Morse Chain Co.

FOR MORE DATA CIRCLE NO. 18 ON REPLY CARD

Lead Coating

. . . dries in an hour

The distributorship of a new type rust preventative lead coating, Blakled, is announced by U. S. Steel Supply Division.

Coating is neither a conventional paint skin nor a pigment ground into a vehicle. It fills in the surface of steel and actually replaces moisture and air on the surface, eliminating the principal cause of rust. It may be applied to wet, brushed rusted surfaces, dry or light mill scaled steel. It dries in an hour, may be dipped, sprayed or brushed. U. S. Steel Supply Division, United States Steel Corp.

FOR MORE DATA CIRCLE NO. 19 ON REPLY CARD

FREE LITERATURE

Catalogs and Clip Sheets

Reply card on page 125 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Meehanite Applications

Meehanite Metal Corp.—A 12-page booklet, "Meehanite Cams, Camshafts and Crankshafts," devotes itself primarily to application problems solved by Meehanite products. In addition, it describes briefly the basic metallurgy and important engineering properties of a few types of Meehanite metal most widely used for such service.

FOR MORE DATA CIRCLE NO. 20 ON REPLY CARD

Maintenance Management

Remington Rand Inc. Remington Rand offers a 7-page booklet covering the functions of construction, repair and preventive maintenance programs at a realistic operating cost and maximum equipment productivity. The requirements for an effective maintenance control system are outlined and illustrated.

FOR MORE DATA CIRCLE NO. 21 ON REPLY CARD

Complete Crane Line

Ederer Engineering Co.—A 30-page spiral-bound catalog illustrates and describes the entire Ederer line of overhead handling equipment. Sections on crane selection and component specifications achieve a practical approach to the general questions and definitions that must be considered in plant layout and handling operation.

FOR MORE DATA CIRCLE NO. 22 ON REPLY CARD

Pipe Codes, Standards

Ladish Co.—A catalog on seamless welding fittings, forged flanges and forged steel fittings is offered. Up-to-date in the latest provisions of applicable pipe codes and standards, the book devotes nearly 200 pages to dimensions and specifications on seamless welding fittings, forged steel flanges, forged screwed and socket welding fittings, forged weldless rolled rings and stainless and alloy fittings.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

Superfinishing

Gisholt Machine Co.—A report by Gisholt records progress made in the superfinishing process. It includes a brief description of the process, complete specifications on the 12 machines and 5 attachments available for this work, plus information and photographs on 28 different job applications.

FOR MORE DATA CIRCLE NO. 24 ON REPLY CARD

Welding at Work

Sciaky Bros. Inc. "Resistance Welding at Work" relates the problems of various manufacturers, and solutions through use of resistance welding. It tells how standard resistance welders have been adapted to do what was previously considered a job requiring special machines.

FOR MORE DATA CIRCLE NO. 25 ON REPLY CARD

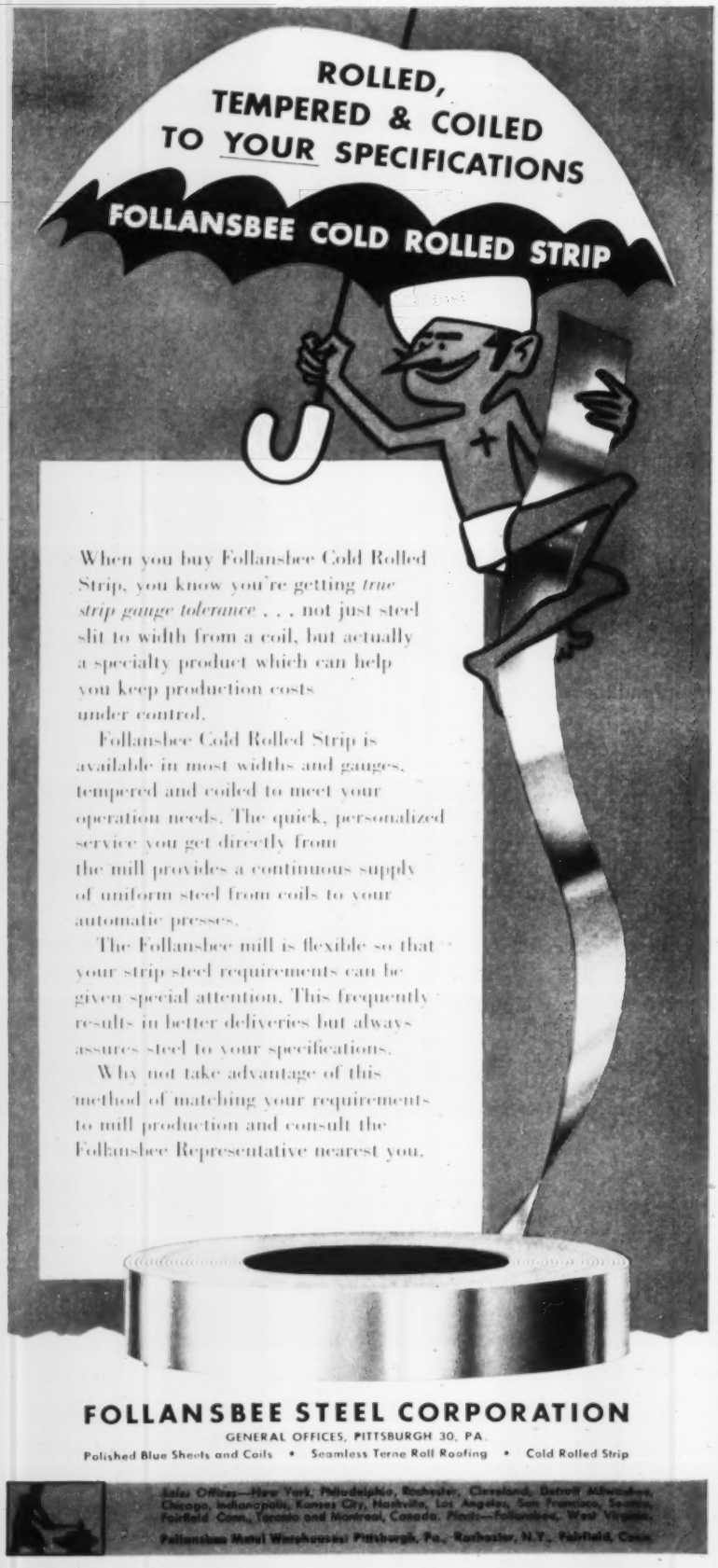
Limit Switch

Square D Co. Complete information on the new type T machine tool limit switch is offered, with application, construction and ordering instructions. All literature is illustrated and contains charts and diagrams.

FOR MORE DATA CIRCLE NO. 26 ON REPLY CARD

Induction Heat for Forging

General Electric Co. An 8-page bulletin on forging with induction heat outlines the prime benefits of the method as utilized in the forging industry. Included is a series of case histories covering various on-the-job applications. Frequency - time - work diameter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TEMPERED & COILED
TO YOUR SPECIFICATIONS
FOLLANSBEE COLD ROLLED STRIP
When you buy Follansbee Cold Rolled Strip, you know you're getting *true strip gauge tolerance* . . . not just steel slit to width from a coil, but actually a specialty product which can help you keep production costs under control.
Follansbee Cold Rolled Strip is available in most widths and gauges, tempered and coiled to meet your operation needs. The quick, personalized service you get directly from the mill provides a continuous supply of uniform steel from coils to your automatic presses.
The Follansbee mill is flexible so that your strip steel requirements can be given special attention. This frequently results in better deliveries but always assures steel to your specifications.
Why not take advantage of this method of matching your requirements to mill production and consult the Follansbee Representative nearest you.
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Polished Blue Sheets and Coils • Seamless Terne Roll Roofing • Cold Rolled Strip
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Follansbee Metal Warehouses: Pittsburgh, Pa., Rochester, N.Y., Fairfield, Conn.

charts are included to aid in determining power requirements.

FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

Testing Topics

Baldwin-Lima-Hamilton Corp.—An article covering simulated service testing machines for transmission gears and gear lubricants is in the latest issue of "Testing Topics." Also included in the house organ is an article on experimental determination of strains in prestressed-concrete pipe. Baldwin also offers a domestic price list of load, torque and pressure sensitive devices.

FOR MORE DATA CIRCLE NO. 28 ON REPLY CARD

Materials Handling

Heppenstall Co.—A 20-page booklet covers fast, safe, economical materials handling and the Heppenstall equipment offered for specific handling applications. Each type of the company's handling equipment is covered, described and illustrated.

FOR MORE DATA CIRCLE NO. 29 ON REPLY CARD

Gear Drive Handbook

W. A. Jones Foundry & Machine Co.—Latest engineering developments by Jones Foundry are described in a 160-page catalog. A detailed text is supported by charts, diagrams and illustrations. All types of their gear drives are covered.

FOR MORE DATA CIRCLE NO. 30 ON REPLY CARD

Sand Screen

Carborundum Co.—A 4-page brochure covers Carborundum's nonclogging open-mesh abrasive material. The screen is designed especially for sanding operations where loading or glazing is a problem. A sample of the material is included with each brochure.

FOR MORE DATA CIRCLE NO. 31 ON REPLY CARD

Grinding Oils

D. A. Stuart Oil Co. Ltd.—A 16-page book on grinding oils covers characteristics and functions of seven Stuart products. Proper applications and specific recommendations are covered. Suggestions for beneficial handling of grinding oils in the plant are also made.

FOR MORE DATA CIRCLE NO. 32 ON REPLY CARD

Better Drilling

Buffalo Forge Co.—Machine Tool Division offers an instructive

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booklet called "Guide Book for Better Drilling." Contents in the 24-page book include a drilling chart, tapping chart, tips on selection and application of seven models of Buffalo drilling machines, cause of tap failures, a list of don'ts for operators.

FOR MORE DATA CIRCLE NO. 33 ON REPLY CARD

Product Survey

Worthington Corp.—A bulletin containing information about special features, types, sizes and capacities of Worthington's various product lines of industrial equipment is offered. The application of each of the lines is covered. Illustrations show how their products apply in different types of industry.

FOR MORE DATA CIRCLE NO. 34 ON REPLY CARD

Encyclopedia of Painting

Steel Structures Painting Council —The first of two volumes of the "Steel Structures Painting Manual" has been released. Entitled "Good Painting Practice," the volume describes the best of the current surface preparation and painting practices in various industries. It is a practical encyclopedia of economical and satisfactory painting methods, rather than a technical treatise on paint formulation.

FOR MORE DATA CIRCLE NO. 35 ON REPLY CARD

Precision Balls

Coolidge Corp. — A four-page brochure covering Coolidge chrome alloy and stainless steel, manufactured from high grade electric furnace steel, is offered. Ordering, packaging and shipping information should help simplify these functions for the user.

FOR MORE DATA CIRCLE NO. 36 ON REPLY CARD

Cleaning Equipment

U. S. Hoffman Machinery Corp. — Air Appliance Division has released a 12-page booklet which gives an analysis of the costly problem of industrial dust and describes a complete line of vacuum cleaning equipment designed to combat it. The basic working elements of the company's permanently installed vacuum cleaning systems with central dust collection are described in detail.

FOR MORE DATA CIRCLE NO. 37 ON REPLY CARD

Mill Drives

General Electric Co.—A bulletin on rubber and plastic mill drives, featuring enclosed synchronous mill motors with rubber-mill control is available. Its 4 pages contain descriptions and advantages of the equipment and include application photographs.

FOR MORE DATA CIRCLE NO. 38 ON REPLY CARD

Projector, Comparator

Portman Instrument Co. Inc.—Two bulletins covering model OFG-200 optical form grinder projector-comparator and the model R-300 optical comparator are available. Both bulletins are amply illustrated supporting the detailed text.

FOR MORE DATA CIRCLE NO. 39 ON REPLY CARD

Die Stamping

Federal Tool & Mfg. Co.—Die stamping of special wrenches and nonmetallic materials is stressed in a 4-page brochure offered by Federal. The illustrated brochure provides information on special wrenches die stamped to specifications, and phenolic resins, vulcanized fibers, plastic and insulation paper stampings.

FOR MORE DATA CIRCLE NO. 40 ON REPLY CARD

Palletized Handling

Barrett-Cravens Co.—Crescent Truck Division has prepared a 16-page bulletin giving specifications

For free literature, editorial clips or more information on products described in this issue, circle the corresponding number at left—or fill in box below.

ARTICLE OR ADVERTISEMENT	PAGE

NAME — TITLE

COMPANY

PRODUCT(S) MANUFACTURED

ADDRESS

CITY AND STATE

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5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
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and dimensional drawings on its eight Palletier models, having capacities from 1000 to 8000 pounds. Improved features of the Palletier are illustrated.

FOR MORE DATA CIRCLE NO. 41 ON REPLY CARD

Coolants and Lubricants

Metal Carbides Corp.—Technical Bulletin No. TB-2 includes recommendations on coolants and lubricants for talide tungsten carbide cutting tools and drawing dies. Included are coolants and cutting oil, suggestions for machining all types of wire, bars and tubes and lubricants for use on a variety of metalworking operations.

FOR MORE DATA CIRCLE NO. 42 ON REPLY CARD

Molding Machines

Herman Pneumatic Machine Co.—"Let's Look at the Herman Line of Molding Machines," a 24-page catalog printed in two colors, includes the company's complete line. Eleven machines are prominently displayed and their operations clearly explained.

FOR MORE DATA CIRCLE NO. 43 ON REPLY CARD

Tow Line Catalog

Nutting Truck & Caster Co.—An 8-page Tow Line catalog which includes complete information on a large variety of trucks adaptable for either underfloor or overhead conveyor two-line systems is offered by Nutting. It contains straight product shots with complete specifications and operation sequence illustrations in actual plant installations.

FOR MORE DATA CIRCLE NO. 44 ON REPLY CARD

Tubing Analyses

Babcock & Wilcox Co.—Tubular Products Division offers a folder listing analyses and mechanical properties of 29 carbon, alloy and stainless tubing steels used in various types of heat exchangers and condensers. Additional data presented in tables include reference specifications and application information.

FOR MORE DATA CIRCLE NO. 45 ON REPLY CARD

Turbine Generators

Worthington Corp.—Geared turbine generators, 200 kw to 1500 kw, for both ac and dc service, are the subject of Bulletin 1969 offered by Worthington. It describes engineering and construction features, including two types of governing arrangements, hand and automatic nozzle controls, and other control accessories in its 23 pages.

FOR MORE DATA CIRCLE NO. 46 ON REPLY CARD

Fastening Selector

Mac-it Parts Co.—A 36-page catalog "Better Fastening for Better Products" was written to assist industry in the engineering and selection of better fasteners for its products. Illustrated index, complete data on physical characteristics and American Standards Association dimensions are included.

FOR MORE DATA CIRCLE NO. 47 ON REPLY CARD

EDITORIAL REPRINTS:

Coatings in Cold Forming

Lubricants have a dual job in cold forming. Here's Dr. Samuel Spring's STEEL article telling how phosphate combinations achieve success in the twin function of surface separator and friction reducing agent.

FOR MORE DATA CIRCLE NO. 48 ON REPLY CARD

Weld Distortion

J. R. Stitt, R. C. Mahon Co., says distortion can be designed out of welded structures. In a recent STEEL article he says that understanding what happens in the heat-affected zones is the tipoff to effective procedures for ending warpage and upsetting.

FOR MORE DATA CIRCLE NO. 49 ON REPLY CARD

Hot Dip Galvanizing

Here's Part III of the hot dip galvanizing series. K. S. Frazier, Detroit Steel Products Co., tells why careful analysis of materials and methods is required. Low-carbon, open-hearth steels are most suitable, for example, but even they vary considerably. Coatings may be too porous or too dark.

FOR MORE DATA CIRCLE NO. 50 ON REPLY CARD

Reactor Assets

A staff-written STEEL article tells why you should take a second look at your reactor assets. Since private industry is now being asked to develop materials for atomic energy projects, nuclear reactor assets are taking on new significance for industry.

FOR MORE DATA CIRCLE NO. 51 ON REPLY CARD

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7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

3-22-54

For free literature, editorial clips or more information on products described in this issue, circle the corresponding number at left—or fill in box below.

AFFIX OR ROUGH PRINT

PAGE

NAME — TITLE

COMPANY

PRODUCTS MANUFACTURED

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CITY AND STATE

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Market Outlook

STEEL INGOT production is down approximately 33 per cent from a year ago. But don't let that mislead you into believing that business in general is that bad.

The readjustment in steel ingot output is much sharper than in various other industries. And there's a good reason. Last year, steel production ran ahead of consumption. Steel was put into inventory. Now, steel output is coasting until inventories can be used up.

IT'S NATURAL—When steel is as readily available as it is today, users are inclined to cut their inventories to the bone.

Steel ingot production actually is lower than the rate of output of finished steel, for the reduction of inventories extends even into the steel plants. Their rolling mills are drawing upon semifinished steel that had been stacked up. While these inventories are being liquidated, ingot production rates are held below rates of finishing.

GOOD BAROMETER—One evidence that business in general is not as low as steel ingot production is electric power output. It's a good barometer because electricity is so universally used in industry and because half of all electricity sold is used by industry. Electricity output is running around 5 per cent above the year-ago figures. Even if you allow for the increasing use of electricity in industry there isn't a drop as steep as that in steel ingot production. In the big and important central industrial district electricity output is down only 2 or 3 per cent from a year ago.

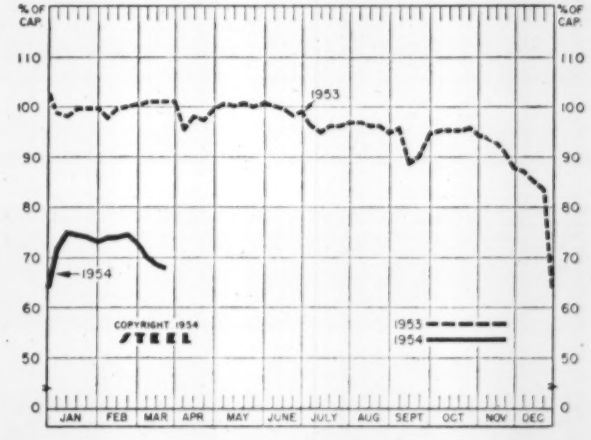
NOT SO BAD—Everyone knows that automobile producers, who use a fifth of all finished steel, are not able to sell as many cars as they sold a year ago. But their production isn't down as much as steel ingot output. Auto production is only 15 per cent below that of a year ago.

It's clear that much of the drop in steel ingot production stems from inventory reduction by steel users, but it's not equally clear whether such a reduction now will prove to be wholly advantageous in June. Wage contracts with the steelworkers are due for renewal then. While a strike does not now appear probable, a strike would hurt steel consumers quicker than at any time in the last several years. They would not have the big steel inventories to keep them going like they did in the summer of 1952. Then only a handful of steel users were handicapped, even though the strike lasted two months. That's evidence they had built up large inventories.

STEEL SCRAMBLE?—If somehow it appears that labor negotiations are short-circuiting into a strike, the advantage of ample inventories may be recalled and a scramble for steel could ensue. Right now, a strike next June doesn't seem likely. The steelworkers' union has a different leader than it had two years ago, and reduced employment has made men hold more tenaciously to their jobs. On the other hand, a sharp climb in unemployment might spur an all-out drive for the guaranteed annual wage, and such a drive might lead to a strike.

OUTPUT SHRINKS—While consumers continue their inventory reduction, the steel ingot production rate shrinks. In the week ended Mar. 21 it dropped half a point from the preceding week and registered 68 per cent of capacity.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Mar. 21	Change	Same Week 1953	Same Week 1952
Pittsburgh	73	— 6*	106	103
Chicago	79	+ 4*	104	105.5
Mid-Atlantic	62	— 3	97	98
Youngstown	66	0	106	103
Wheeling	79.5	— 3	100	99.5
Cleveland	60	— 5	100	98
Buffalo	63.5	0	106.5	104
Birmingham	78.5	0	98	102
New England	60	0	88	85
Cincinnati	71.5	0	101	98
St. Louis	43.5	0	88	84
Detroit	80	+ 4*	106	104
Western	73	— 1	106.5	101
National Rate	68	— .5	101	102

INGOT PRODUCTION‡

	Week Ended Mar. 21	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	100.6	102.8	110.7	142.4
NET TONS (In thousands)	1,616†	1,652	1,779	2,288

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Mar. 16

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.600	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H.R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	4.975	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.873	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.863	Pipe, galv., buttweld (100 ft)	17.699	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.960	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., alloy	11.075	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.367	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.799
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, C.R., carbon	5.704	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.065
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.075	Sheets, galvanized	6.945	Tubing, mechanical, stainless, 304 (100 ft)	161.193		
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.550	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.000				
		Strip, C.R., carbon	7.243				

‡ Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Mar. 16 1954	Mar. 9 1954	Month Ago	Feb. Average
(1947-1949=100)	140.9	140.9	140.9	140.9

STEEL's FINISHED STEEL PRICE INDEX*

	Mar. 18 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.74	189.74	189.74	181.31	154.85
Index in cents per lb	5.140	5.140	5.140	4.912	4.195

STEEL's ARITHMETICAL PRICE COMPOSITES

	Mar. 18 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT*	$113.73	$113.73	$113.91	$110.98	$97.32
No. 2 Fdry Pig Iron, GT	56.54	56.54	56.54	55.04	46.63
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.22
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	47.34
Steelmaking Scrap, GT	24.33	24.17	26.83	44.17	35.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Mar. 18 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.816
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.275
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, del., Philadelphia	4.38	4.38	4.38	4.13	3.492
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.10	4.10	4.10	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.10	4.10	4.10	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.975-4.225	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.10-5.80	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.475-5.225	4.325
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.35	5.775
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$7.75
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ½-⅝" Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	Mar. 18 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, del. Phila.	59.66	59.66	59.66	59.25	50.30
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, del. Phila.	60.16	60.16	60.16	59.75	50.80
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.43
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$25.50	$25.50	$28.50	$44.00	$37.00
No. 1 Heavy Melt, E. Pa.	22.00	22.00	25.00	46.00	35.50
No. 1 Heavy Melt, Chicago	25.50	25.00	27.00	42.50	33.25
No. 1 Heavy Melt, Valley	23.50	23.50	25.50	44.25	37.25
No. 1 Heavy Melt, Cleve.	20.50	20.50	23.50	44.25	35.25
No. 1 Heavy Melt, Buffalo	24.00	24.00	25.00	43.50	35.75
Rails, Rerolling, Chicago	36.50	36.50	36.50	56.00	45.75
No. 1 Cast, Chicago,	33.00	31.50	29.50	44.00	41.50
COKE, Net Ton					
Beehive, Furn, Connisvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+ %, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb del.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg, $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.75-30.00 del. Conn. Valley, 29.875-30.125 del. Midwest; Lake 30.00 del.; Fire refined 29.75 del.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 12.80, chemical 12.90, corroding 12.90, St. Louis, New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, selfpalletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more, f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $202-$204 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or

DAILY NONFERROUS PRICE RECORD

	Price Mar. 18	Change	Previous Price	Feb. Avg.	Jan. Avg.	Mar. 1953 Avg.
Copper	29.75-30.00	Mar. 3	29.50-30.00	29.750	29.750	30.510
Lead	12.80	Mar. 10	12.55	12.610	13.060	13.300
Zinc	9.75	Mar. 10	9.25	9.369	9.760	11.000
Tin	93.50 nom.	Mar. 18	90.50	85.181	85.100	121.500
Nickel	60.00	Jan. 14	56.50	60.000	60.000	60.000
Aluminum	21.50	July 15	20.50	21.500	21.500	20.500
Magnesium	27.00	Mar. 9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99 + %, del.; Magnesium 99.8%, Freeport, Tex.

ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $21 per troy oz.

Platinum: $84-$87 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $70-$75 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, spot, 95.50 nom.; prompt, 93.50 nom.; guaranteed March delivery, 95.50.

Titanium: Sponge, 99.3+%, $5 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.95 per lb f.o.b. shipping point; less than 1000 lb $5.10; 99+% hydrogen reduced, $5.85. Treated ingots $7.95.

Zinc: Prime Western 9.75, brass special 10.00, intermediate 10.25, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.10, special high grade 11.25, die casting alloy ingot 13.75, del.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.
(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 19.50-20.50; No. 12 foundry alloy (No. 2 grade) 19.00-19.50, 5% silicon alloy, 0.60 Cu max., 22.00-22.50; 13 alloy, 0.60 Cu max., 22.00-22.50; 195 alloy 21.00-21.50; 108 alloy 19.50-20.00 steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 20.00-21.00; grade 2, 19.00-19.50; grade 3, 18.00-18.50; grade 4, 16.50-17.00.

Brass Ingot: Red brass, No. 115, 23.50; tin bronze No. 225, 34.25; No. 245, 28.50; high-leaded tin bronze, No. 305, 27.75; No. 1 yellow, No. 405, 19.75; manganese bronze No. 421, 24.25.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 29.00; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c. 37.03. Magnet wire del., 15,000 lb or more 41.83; l.c.l., 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $18.00 per cwt; pipe, full coils $18.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 100,000 lb and over, f.o.b. mill.) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	66.5	90.5
Rod, Shapes	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb)
Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 43.8-34.4, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 50.2-38.4 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
⅜	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 108.00, 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 53.00, 20,000 lb or more 0.188-1.0 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ⅛-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clippings 11.00; low copper clippings 11.00; mixed clippings 9.00-10.00; old sheet 8.00-9.00; borings and turnings 5.50; pistons and struts 5.50; crankcases 8.00-9.00; industrial castings 8.00-9.00.

Copper and Brass: Heavy copper and wire, No. 1 23.00-23.50; No. 2 copper 21.00-21.50; light copper 19.00-19.50; No. 1 composition red brass 16.50-17.00; No. 1 composition turnings 16.00-16.50; mixed brass turnings 10.50-11.00; new brass clippings 16.00-16.50; No. 1 brass rod turnings 11.50-12.00; light brass 10.00-10.50; heavy yellow brass 12.00-12.50; new brass rod ends 14.00-14.50; auto radiators, unsweated, 12.50-13.00; cocks and faucets 14.00-14.50; brass pipe 15.50-16.00.

Lead: Heavy 9.50-10.00; battery plate 5.00-5.50; linotype and stereotype 12.25; electrotype 10.50; mixed babbitt 11.50-12.00.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.75; new die cast scrap, 3.50; old die cast scrap, 3.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 14.50-15.00; 51S, 52S clippings 14.50-15.00; 14S, 17S, 24S clippings 13.00-14.00; mixed clippings 13.00-14.00; old sheet 11.50-12.00; old cast 11.50-12.00; clean old cable, free of steel 14.50-15.00; borings and turnings 12.00-12.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 25.00-25.50; No. 2 copper 23.50-24.00; light copper 22.00-22.50; refinery brass (60% copper) per dry copper content 21.00; auto radiators, 14.75, nominal.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 25.50; No. 2 copper 24.00; light copper 22.50; No. 1 composition borings 18.00; No. 1 composition solids 18.50; heavy yellow brass solids 14.00; yellow brass turnings 13.00; radiators 14.50.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.75 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.105; 200-499 lb $1.09; 500-999 lb $1.085; 1000 lb or more $1.08.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.
Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.
Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.
Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.
Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 5,000-35,500 lb
Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.
Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.
Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1-cent premium to above.
Sodium Stannate: Less than 100 lb 70.6; 100-600 lb 56.3; 700-1900 lb 53.9; 2000-9900 lb 52.1; 10,000 lb or more 51.0.
Stannous Chloride (Anhydrous): Less than 50 lb $1.564; 50 lb $1.224; 100-300 lb $1.074; 400-900 lb $1.049; 100 -1900 lb $1.025; 2000-4900 lb 98.8; 5000-19,000 lb 92.7; 20,000 lb and over 86.6
Stannous Sulphate: Less than 50 lb $1.264; 50 lb 96.4; 100-1900 lb 94.4; 2000 lb and over 92.4.
Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	33.50d	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Nonferrous Metals

Nonferrous scrap market is buoyant, thanks to strong export demand. Dollar volume of nonferrous scrap should be nearly as large this year as last

FOR A PARADOX in metals, look what's happening in scrap.

While the iron and steel scrap market is flat on its back (p.157), dealers in nonferrous scrap are riding high. Total nonferrous scrap metal volume last year topped $800 million —and 1954 should be nearly as good, even conceding a drop in copper scrap prices from present high levels.

New Customer—The sharp contrast exists despite about nine months of reduced buying by U. S. secondary copper refiners, brass and bronze ingotmakers, and smelters of aluminum, lead and zinc. Importance of the secondary metals industry to the economy is demonstrated in copper and copper-base alloys, where total secondary recovery per year approximately equals primary production.

The difference between ferrous and nonferrous scrap conditions lies chiefly in a strong export market for the latter, explained Henry S. Klingenstein, Keystone Metal Co., Pittsburgh, at the 41st annual convention of the National Association of Waste Material Dealers last week in New York.

Open-Ended — When scrap prices started declining last July and August, said Mr. Klingenstein, metal dealers "suddenly and somewhat unexpectedly acquired a new customer." Japan, Germany, and to a lesser extent Italy, France and England, entered the market for copper, brass and aluminum scrap as government open-ending of exports came into effect.

In the final five months of last year an average of 13,000 tons of copper and brass scrap left the country monthly. Lack of dollar exchange forced Japan to cease new purchases in January, but shipments on old orders plus active European buying kept the market strong.

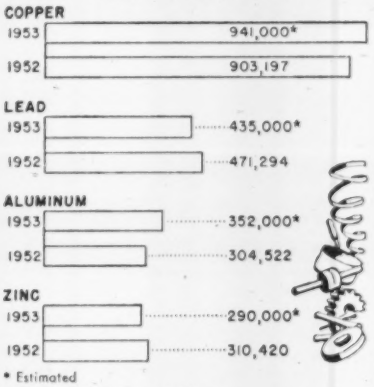
Disagreement — Domestic scrap users as a result have been forced to raise their buying prices to compete with the exporters and are worried about getting sufficient supplies. Refineries and brass mills have felt the pinch. Ingotmakers are producing less than 20,000 tons monthly though equipped to handle several times that volume. Their problem is essentially one of slow foundry activity.

Most scrap users here are willing to have open export of scrap up to a certain point. "That point," says one of them, "lies in the price limit at which we can compete with primary metal." Pros and cons of export restrictions were scheduled for airing at a Copper Scrap Industry Advisory Committee session in Washington last week.

REBIRTH

Metals Recovered from Scrap

(Tons of 2000 pounds)



* Estimated

Source: U. S. Bureau of Mines

Mild Awakening—The strong export factor, says Mr. Klingenstein, "plus a mild awakening by the refineries, low inventories in the hands of smelters and reduced inventories at mills indicate that our marketing problem (in copper) will not be severe." Aluminum, lead and zinc scrap have not gyrated as much as copper but have followed the market demand for their respective finished metals."

Transactions between metals dealers, termed "mainspring of our trading activity" by one of them, stimulates business. If steel mills don't buy, scrap iron is dormant, but a metal dealer can always find a fellow dealer who is a buyer. Scrap men feel replacement, improvements and economies made by cost-conscious industry will produce scrap.

Though current lack of activity in scrap iron will to some extent reduce tonnage of metal received by dealers, scrap iron dealers will release inventories of metals and peddlers will concentrate more on metals.

Large tonnages of scrap were processed last year as large inventories were liquidated after price controls ended, but scrap metal men see 1954 volume as highly satisfactory, despite predictions by most economists of a slump.

Aluminum on the Rebound

Good news for the aluminum industry came from two directions last week:

Martin L. Tressel, manager of Aluminum Co. of America's Metal Planning Division, told the NAWMD meeting that the aluminum industry is fast pulling ahead of the current period of economic readjustment. "Our new net orders in February were greater than they were in January, and our new orders in March are running considerably ahead of those in February," said Mr. Tressel.

From the Aluminum Association came support for the upturn. Shipments of aluminum products in January were higher than December in foil, extruded products, drawn tube, rod and bar, wire, ACSR and bare cable, permanent mold and diecastings. Only categories lower were sheet and plate, forgings and sand castings. Primary production was up 5956 tons to a new all-time high of 116,247 tons.

Sweating It Out

Sharply rapping the Defense department for "misleading statements, inferences and tactics" to justify its competition with private industry, the Senate Select Committee on Small Business reported that continued operation of aluminum sweating furnaces by the Air Force and Navy is "unnecessary and unjustifiable."

In reply, Assistant Secretary of Defense Charles S. Thomas said the Air Force intends to continue operating its own sweating furnaces and that the program will be accelerated as obsolete aircraft are replaced. While the Defense department has cut out 17 scrap metal facilities, the disposal program will be retained because the government figures it can get a better return by melting down the aluminum and selling it in ingot form. Aluminum remelts today account for about 80 per cent of the Air Force scrap disposal program.

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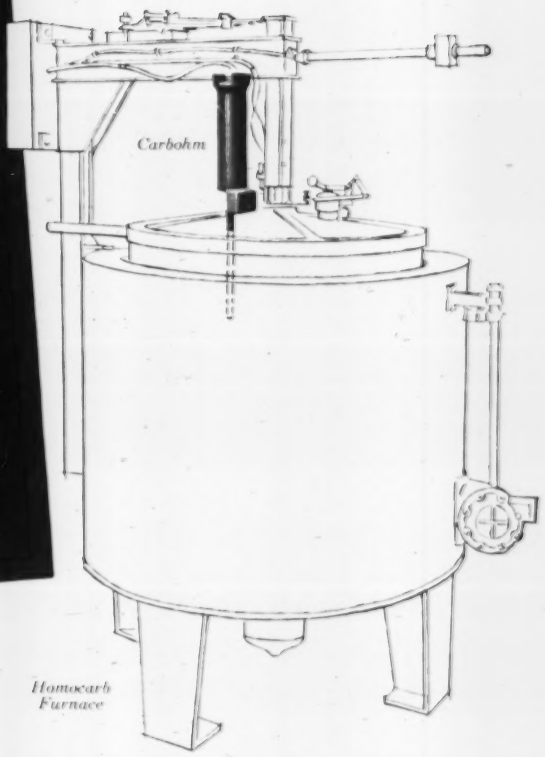
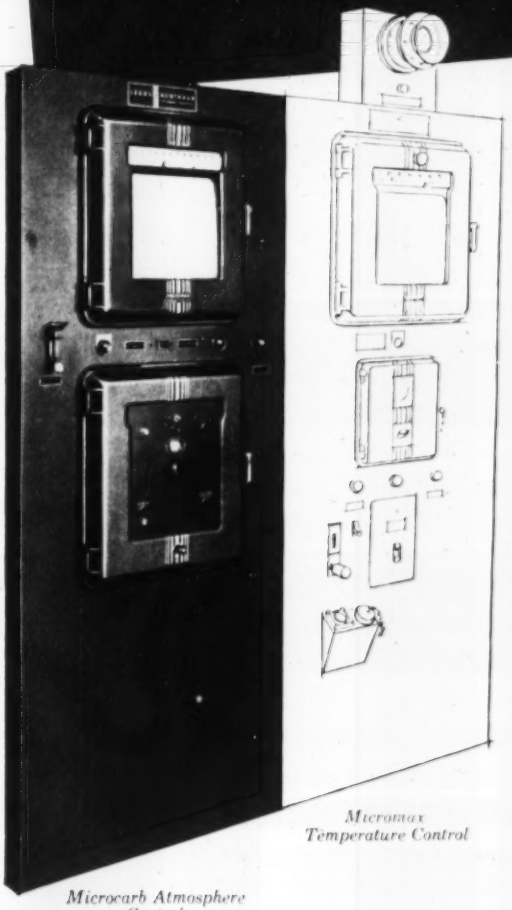


Homocarb Furnace



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STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 133. Key to footnotes, page 135.

SEMIFINISHED

INGOTS, Carbon Forging (NT)
Fontana,Calif. K1 ....$86.00
Munhall,Pa. U5 .....59.00

INGOTS, Alloy (NT)
Detroit R7 .....$63.00
Fontana,Calif. K1 ....88.00
Midland,Pa. C18 .....62.00
Munhall,Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa, Pa. J5 ....$62.00
Bessemer,Pa. U5 .....62.00
Clairton,Pa. U5 .....62.00
Ensley,Ala. T2 .....62.00
Fairfield,Ala. T2 .....62.00
Fontana,Calif. K1 ....70.00
Gary,Ind. U5 .....62.00
Johnstown,Pa. B2 ....62.00
Lackawanna,N.Y. B2 ..62.00
Munhall,Pa. U5 .....62.00
So.Chicago,Ill. U5 ....62.00
So.Duquesne,Pa. U5 ..62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 .....75.50
Buffalo R2 .....75.50
Clairton,Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken,Pa. A3..82.50
Detroit R7 .....78.50
Ensley,Ala. T2 .....75.50
Fairfield,Ala. T2 ....75.50
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....75.50
Geneva,Utah C11 ....75.50
Houston S5 .....83.50
Johnstown,Pa. B2 ....75.50
Lackawanna,N.Y. B2 ..75.50
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....75.50
Seattle B3 .....89.00
So.Chicago R2,U5,W14 75.50
So.Duquesne,Pa. U5 ..75.50
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$82.00
Buffalo R2 .....82.00
Canton,O. R2, T7 .....82.00
Conshohocken,Pa. A3 ..89.00
Detroit R7 .....84.00
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....82.00
Houston S5 .....90.00
Ind.Harbor,Ind. Y1 ...82.00
Johnstown,Pa. B2 ....82.00
Lackawanna,N.Y. B2 ..82.00
LosAngeles B3 .....102.00
Massillon,O. R2 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
So.Chicago R2,U5,W14 82.00
So.Duquesne,Pa. U5 ..82.00
Struthers,O. Y1 .....82.00
Warren,O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo,R2 .....$92.50
Canton,O. R2 .....92.50
Cleveland R2 .....92.50
Fontana,Calif. K1 ....113.50
Gary,Ind. U5 .....92.50
Massillon,O. R2 .....92.50
So.Chicago,Ill. R2 ....92.50
So.Duquesne,Pa. U5 ..92.50

SHEET BAR (NT)
Fontana,Calif. K1 ....$93.18

SKELP
Aliquippa,Pa. J5 .....3.85
Munhall,Pa. U5 .....3.75
Warren,O. R2 .....3.75
Youngstown R2, U5 ....3.75

WIRE RODS
AlabamaCity, Ala. R2..4.525
Aliquippa,Pa. J5 .....4.525
Alton,Ill. L1 .....4.70
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora,Pa. A7 .....4.525
Fairfield,Ala. T2 .....4.525
Fontana,Calif. K1 ....5.325
Houston S5 .....4.925
Johnstown,Pa. B2 ....4.525
Joliet,Ill. A7 .....4.525
KansasCity,Mo. S5 ....4.865
LosAngeles B3 .....5.325
Minnequa,Colo. C10 ..4.775
Monessen,Pa. P7 .....4.525
No.Tonawanda,N.Y.B11 4.525
Pittsburg,Calif. C11 ...5.175
Portsmouth P12 .....4.525
Roebling,N.J. R5 .....4.625
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2..4.625
Sterling,Ill.(1) N15 ..4.525
Struthers,O. Y1 .....4.525
Torrance,Calif. C11 ...5.325
Worcester,Mass. A7 ...4.825

STRUCTURALS

Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Bessemer,Ala. T2 .....4.10
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2 ....4.10
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ...4.15
LosAngeles B3 .....4.80
Minnequa,Colo. C10 ....4.55
Munhall,Pa. U5 .....4.10
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 ....4.15
Seattle B3 .....4.85
So.Chicago,Ill. U5, W14 4.10
So.SanFrancisco B3 ...4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 .....4.10

Wide Flange
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fontana,Calif. K1 .....5.10
Lackawanna,N.Y. B2 ...4.15
Munhall,Pa. U5 .....4.10
Phoenixville,Pa. P4 ....4.95
So.Chicago,Ill. U5 .....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.40
Gary,Ind. U5 .....5.00
Munhall,Pa. U5 .....5.00
So.Chicago,Ill. U5 .....5.00

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....6.175
Bessemer,Ala. T2 .....6.175
Bethlehem,Pa. B2 .....6.20
Clairton,Pa. U5 .....6.175
Fairfield,Ala. T2 .....6.175
Fontana,Calif. K1 ....6.825
Gary,Ind. U5 .....6.175
Geneva,Utah C11 .....6.175
Ind.Harbor,Ind. I-2 ....6.175
Ind.Harbor,Ind. Y1 ....6.675
Johnstown,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ...6.20
LosAngeles B3 .....6.85
Munhall,Pa. U5 .....6.175
Seattle B3 .....6.90
So.Chicago,Ill. U5, W14 6.175
So.SanFrancisco B3 ....6.80
Struthers,O. Y1 .....6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ...6.20
Munhall,Pa. U5 .....6.125
So.Chicago,Ill. U5 .....6.125

BEARING PILES
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 .....4.10

PILING

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....4.925
Lackawanna,N.Y. B2 ...4.925
Munhall,Pa. U5 .....4.925
So.Chicago,Ill. U5 .....4.925

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Ashland,Ky. (15) A10..4.10
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Claymont,Del. C22 .....4.10
Cleveland J5, R2 .....4.10
Coatesville,Pa. L7 .....4.10
Conshohocken,Pa. A3 ..4.10
Ecorse,Mich. G5 .....4.30
Fairfield,Ala. T2 .....4.10
Fontana,Calif.(30) K1 ..4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
GraniteCity,Ill. G4 ....4.30
Harrisburg,Pa. C5 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2, Y1 4.10
Johnstown,Pa. B2 .....4.10
Lackawanna,N.Y. B2 ...4.10
LoneStar,Tex. L6 ....4.50
Minnequa,Colo. C10 ....4.95
Munhall,Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Riverdale,Ill. A1 .....4.10
Seattle B3 .....5.00
Sharon,Pa. S3 .....4.10
So.Chicago,Ill. U5, W14 4.10
SparrowsPoint,Md. B2 ..4.10
Steubenville,O. W10 ....4.10
Warren,O. R2 .....4.10
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5, Y1 4.10

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 .....5.90
Geneva,Utah C11 .....5.25

PLATES, Wrought Iron
Economy,Pa. B14 .....9.30

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.25
Bessemer,Ala. T2 .....6.25
Clairton,Pa. U5 .....6.25
Cleveland J5 .....6.25
Conshohocken,Pa. A3 ..6.25
Ecorse,Mich. G5 .....6.45
Fairfield,Ala. T2 .....6.25
Fontana,Calif.(30) K1 ..6.95
Gary,Ind. U5 .....6.25
Geneva,Utah C11 .....6.25
Ind.Harbor,Ind. I-2 ....6.25
Ind.Harbor,Ind. Y1 ....6.75
Johnstown,Pa. B2 .....6.25
Lackawanna,N.Y. B2 ...6.25
Munhall,Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon,Pa. S3 .....6.25
So.Chicago,Ill. U5, W14 6.25
SparrowsPoint,Md. B2 ..6.25
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont,Del. C22 .....5.55
Coatesville,Pa. L7 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Johnstown,Pa. B2 .....5.55
Munhall,Pa. U5 .....5.55
Sharon,Pa. S3 .....5.55
So.Chicago,Ill. U5, W14 5.55
SparrowsPoint,Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 .....5.15
Conshohocken,Pa. A3 ..5.15
Harrisburg,Pa. C5 .....5.15
Ind.Harbor,Ind. I-2 ....5.15
Munhall,Pa. U5 .....5.15
So.Chicago,Ill. U5 .....5.15

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..4.35
Ashland,l.c.l.(15) A10 ..4.85
Cleveland, c.l. R2 .....4.70
Warren,O. c.l. R2 .....4.70

BARS

BARS, Hot-Rolled Carbon
Aliquippa,Pa. J5 .....4.15
Alton,Ill. L1 .....4.35
Atlanta,Ga. A11 .....4.40
Bessemer,Ala. T2 .....4.15
Buffalo(31) R2 .....4.18
Clairton,Pa. U5 .....4.15
Cleveland(31) R2 .....4.21
Detroit R7 .....4.30
Ecorse,Mich. G5 .....4.35
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Gadsden,Ala.(31) R2 ...4.18
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 .....4.75
Lackawanna,N.Y. B2 ...4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.60
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y. B11 4.15
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
Portland,Oreg. O4 .....4.90
Seattle B3, N14 .....4.90
So.Chicago U5, W14 ....4.15
Chicago(31) R2 .....4.22
So.Duquesne,Pa. U5 ....4.15
So.SanFran.,Calif. B3 ..4.90
Sterling,Ill.(1) N15 ....4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 .....4.85
Weirton,W.Va. W6 .....4.15
Youngstown U5 .....4.15
Youngstown(31) R2 .....4.20

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.875
Buffalo R2 .....4.875
Canton,O. R2, T7 .....4.875
Clairton,Pa. U5 .....4.875
Detroit R7 .....4.975
Ecorse,Mich. G5 .....5.075
Fairless,Pa. U5 .....5.025
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....4.875
Houston S5 .....5.275
Ind.Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 .....4.875
KansasCity,Mo. S5 ....5.475
Lackawanna,N.Y. B2 ..4.875
LosAngeles B3 .....5.925
Massillon,O. R2 .....4.875
Midland,Pa. C18 .....4.875
So.Chicago R2, U5,W14 4.875
So.Duquesne,Pa. U5 ..4.875
Struthers,O. Y1 .....4.875
Warren,O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.225
Bessemer,Ala T2 .....6.225
Bethlehem,Pa. B2 .....6.225
Clairton,Pa. U5 .....6.225
Ecorse,Mich. G5 .....6.425
Fairfield,Ala. T2 .....6.225
Fontana,Calif. K1 ....7.475
Gary,Ind. U5 .....6.225
Ind.Harb.,Ind. Y1 ....6.725
Ind.Harb.,Ind. I-2 ....6.225
Johnstown,Pa. B2 .....6.225
Lackawanna,N.Y. B2..6.225
LosAngeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So.Chicago W14 .....6.225
So.Duquesne,Pa. U5 ....6.225
So.SanFrancisco B3 ..6.975
Struthers,O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....4.35

BAR SIZE ANGLES: S. Shapes
Aliquippa,Pa. J5 .....4.15
Atlanta A11 .....4.35
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....5.00
Houston S5 .....5.60
KansasCity S5 .....5.60
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....5.20
BeaverFalls,Pa. M12,R2 5.20
Buffalo B5 .....5.25
Camden,N.J. P13 .....5.65
Carnegie,Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 .....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora,Pa. A7 .....5.20
Elyria,O. W8 .....5.20
FranklinPark,Ill. N5 ....5.20
Gary,Ind. R2 .....5.20
GreenBay,Wis. F7 .....5.20
Hammond,Ind. L2, M13 .5.20
Hartford,Conn. R2 .....5.75
Harvey,Ill. B5 .....5.20
LosAngeles R2 .....6.65
Mansfield,Mass. B5 .....5.75
Massillon,O. R2, R8 ....5.20
Monaca,Pa. S17 .....5.20
Newark,N.J. W18 .....5.65
NewCastle,Pa. (17) B4..5.20
Pittsburgh J5 .....5.20
Plymouth,Mich. P5 .....5.45
Putnam,Conn. W18 .....5.75
Readville,Mass. C14 .....5.75
St.Louis,Mo. M5 .....5.50
So.Chicago,Ill. W14 ....5.20
SpringCity,Pa. K3 .....5.65
Struthers,O. Y1 .....5.20
Waukegan,Ill. A7 .....5.20
Worcester,Mass. W19 ...6.10
Youngstown F3, Y1 .....5.20

BARS, Cold-Finished Alloy (Turned and Ground)
Cumberland,Md. (5) C19 4.45

BARS, Cold-Finishing Alloy
Ambridge,Pa. W18 .....6.325
BeaverFalls,Pa. M12 ...6.325
Bethlehem,Pa. B2 .....6.325
Buffalo B5 .....6.325
Camden,N.J. P13 .....6.50
Canton,O. R2, T7 .....6.325
Carnegie,Pa. C12 .....6.325
Chicago W18 .....6.325
Cleveland A7, C20 .....6.325
Detroit R7 .....6.425
Detroit P17 .....6.475
Detroit B5 .....6.525
Donora,Pa. A7 .....6.325
Elyria,O. W8 .....6.325
Gary,Ind. R2 .....6.325
Hammond,Ind. L2,M13 .6.325
Hartford,Conn. R2 .....6.775
Harvey,Ill. B5 .....6.325
Lackawanna,N.Y. B2 ...6.325
Mansfield,Mass. B5 ...6.775
Massillon,O. R2, R8 ...6.325
Midland,Pa. C18 .....6.325
Monaca,Pa. S17 .....6.325
Newark,N.J. W18 .....6.65
Plymouth,Mich. P5 ....6.525
So.Chicago,Ill. R2,W14 .6.325
SpringCity,Pa. K3 .....6.50
Struthers,O. Y1 .....6.325
Warren,O. C17 .....6.325
Waukegan,Ill. A7 .....6.325
Worcester,Mass. A7 ...6.625
Yougstown F3, Y1 ...6.325

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..4.15
Atlanta A11 .....4.35
Buffalo R2 .....4.15
Cleveland R2 .....4.15
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 .....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
SandSprings,Okla. S5 ..5.00
Seattle B3, N14 .....4.90
So.Chicago,Ill. R2 .....4.15
So.Duquesne,Pa. U5 ....4.15
So.SanFrancisco B3 ....4.90
SparrowsPoint,Md. B2 ..4.15
Sterling,Ill. (1) N15 ...4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 .....4.85
Youngstown R2, U5 ....4.15

BARS, Reinforcing (Fabricated; to consumers)
Johnstown, ¼-1" B2 ...5.55
KansasCity S5 .....6.35
LosAngeles B3 .....5.80
Marion,O. P11 .....5.55
Seattle N14 .....5.80
Seattle B3 .....5.85
So.SanFrancisco B3 ....5.85
SparrowsPt. ¼-1" B2 ..5.55
Williamsport,Pa. S19 ...5.45

RAIL STEEL BARS
Avis,Pa.(3) J8 .....4.25
ChicagoHts.(3) C2, I-2.4.05
ChicagoHts.(4) C2, I-2..4.15
FortWorth,Tex.(26) T4..4.65
Franklin,Pa.(3) F5 ....4.05
Franklin,Pa.(4) F5 ....4.15
Marion,O.(3) P11 .....4.00
Moline,Ill.(3) R2 .....4.15
Tonawanda(3,4) B12 ..4.15
Williamsport,Pa.(3) S19 4.25
Williamsport,Pa.(4) S19.5.45

BARS, Wrought Iron
Economy,Pa.(S.R.)B14 10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
McK.Rks.(S.R.) L5 ...10.40
McK.Rks.(D.R.) L5 ...14.00
McK.Rks.(Staybolt) L5.15.50

SHEETS

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.925
Allenport,Pa. P7 .....3.925
Ashland,Ky.(8) A10 ..3.925
Cleveland J5, R2 .....3.925
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.125
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fairless,Pa. U5 .....4.025
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Geneva,Utah C11 .....4.025
GraniteCity,Ill. G4 ....4.125
Ind.Harbor,Ind. I-2, Y1.3.925
Irvin,Pa. U5 .....3.925

Kokomo,Ind. C16 .....4.025
Lackawanna,N.Y. B2 ..3.925
Munhall,Pa. U5 .....3.925
Newport,Ky. N9 .....3.925
Niles,O. N12 .....5.175
Pittsburg,Calif. C11 ...4.625
Pittsburgh J5 .....3.925
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
SparrowsPoint,Md. B2..3.925
Steubenville,O. W10 ...3.925
Torrance,Calif. C11 ...4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ...3.925
Youngstown U5, Y1 ...3.925

SHEETS H. R. (19 gage)
AlabamaCity,Ala. R2..5.225
Dover,O. R1 .....5.05
Kokomo,Ind. C16 .....5.025
Mansfield,O. E6 .....5.05
Niles, O. N12 .....4.775
Torrance,Calif. C11 ...5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.90
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.10
Fairfield,Ala. T2 .....5.90
Fontana,Calif. K1 ....6.675
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ...5.90
Ind.Harbor,Ind Y1 ....6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ..5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So.Chicago,Ill. U5 .....5.90
SparrowsPoint(36) B2 ..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 ....5.90
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)
Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind.Harbor,Ind. I-2 ...4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)
Allenport,Pa. P7 ....4.775
Cleveland J5, R2 .....4.775
Ecorse,Mich. G5 .....4.975
Fairfield, Ala. T2 ....4.775
Fairless,Pa. U5 .....4.875
Follansbee,W.Va. F4 ..4.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....4.975
Ind.Harbor,Ind. I-2,Y1.4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2 ..4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ...5.725
Pittsburgh J5 .....4.775
Portsmouth,O. P12 ....4.775
SparrowsPoint,Md. B2..4.775
Steubenville,O. W10...4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ....4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low Alloy
Cleveland J5, R2 .....7.225
Ecorse,Mich. G5 .....7.425
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1.7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ..7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2.7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron
Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Culvert

	Cu Alloy	Cu FE
Ashland,Ky A10	6.325	....
Canton,O. R2	6.475	6.925
Fairfield T2	6.075	6.325
Gary,Ind. U5	6.075	6.325
Ind.Harbor I-2	6.075	6.325
Irvin,Pa. U5	6.075	6.325
Kokomo,Ind. C16	6.175	....
MartinsFry.,O.W10	6.075	....
Pitts.,Calif. C11	6.825	....
SparrowsPt. B2	6.075	....
Torrance,Cal. C11	7.075	....

SHEETS, Culvert

	Pure Iron
Ashland,Ky. A10	6.575
Fairfield,Ala. T2	6.225
MartinsFerry,O. W10	6.325

SHEETS, Gal'd No. 10 Steel
AlabamaCity,Ala. R2 ..5.275
Ashland,Ky.(8) A10 ...5.275
Canton,O. R2 .....5.275
Delphos,O. N16 .....5.775
Dover,O. R1 .....5.275
Fairfield,Ala. T2 ....5.275†
Gary,Ind. U5 .....5.275†
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ...5.275
Irvin,Pa. U5 .....5.275†
Kokomo,Ind. C16 ....5.375†
MartinsFerry,O. W10 ...5.275
Niles,O. N12 .....5.275
Pittsburg,Calif. C11 ..6.025†
SparrowsPoint,Md. B2..5.275
Steubenville,O. W10 ...5.275
Torrance,Calif. C11 ..6.275†
Weirton,W.Va. W6 ....5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10 High-Strength Low-Alloy
Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2..8.075

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky.(8) A10 ...5.525
Canton,O. R2 .....6.025

SHEETS, Galvannealed Steel
Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825†
Kokomo,Ind C16 ....5.925†
Niles,O. N12 .....5.825

†Based on 5c zinc

SHEETS, ZINCGRIP Steel
Bulter,Pa. A10 .....5.525
Middletown,O. A10 ....5.525

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

SHEETS, Electrogalvanized
Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED
Bulter,Pa. A10 .....8.625

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ....5.375
Ind.Harbor,Ind. I-2 ...5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10....5.175
Niles,O. N12 .....6.525
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.
Follansbee,W.Va. F4 ..7.30
Follansbee(23) F4 ....7.175
Yorkville,O. W10 .....7.20

SHEETS, Long Terne Steel (Commercial Quality)
BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....5.675
Middletown,O. A10 ....5.675
Niles,O. N12 .....5.675
Weirton,W.Va. W6 ...5.675

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....6.075

SHEETS, Well Casing
Fontana,Calif. K1 ....6.20

STRIP

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2 ..3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 .....4.10
Ashland,Ky.(8) A10 ...3.925
Atlanta A11 .....4.125
Bessemer,Ala. T2 ....3.925
Bridgeport,Conn.(10)S15 3.95
Buffalo(27) R2 .....3.925
Carnegie,Pa. S18 ....4.425
Conshohocken,Pa. A3 ..4.05
Detroit M1 ..... 4.125
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 ....3.925
Fontana,Calif. K1 ....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.325
Ind.Harbor,Ind. I-2 Y1.3.925
Johnstown,Pa.(25) B2..3.925
KansasCity,Mo.(9) S5..4.525
Lackaw'na,N.Y.(25) B2.3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ...5.025
NewBritain(10) S15 ....4.15
N.Tonawanda,N.Y. B11.3.925
Pittsburg,Calif. C11 ...4.675
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3 .....4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2 3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5 .....3.925

STRIP, Hot-Rolled Alloy
Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.40
Fontana,Calif. K1 ....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.80
KansasCity,Mo. S5 ....7.00
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy
Bessemer,Ala. T2 .....5.95
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....5.95
Fontana,Calif. K1 ....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ...5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ..6.00
LosAngeles(25) B3 ....6.70
Seattle(25) B3 .....6.95
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25) B3.6.70
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ..4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon
Anderson,Ind. G5 .....5.45
Bridgeprt,Conn.(10) S15 5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....5.65
Detroit D2, M1, P20....5.65
Dover,O. G6 .....5.45
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ..5.45
Fontana,Calif. K1 .....7.35
FranklinPark,Ill. T6 ..5.70
Ind Harbor,Ind. I-2 ....5.70
Indianapolis C8 .....5.60
Lackawanna,N.Y. B2 ...5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.10
Middletown,O. A10 ....5.45
NewBedford,Mass. R10..6.00
NewBritain(10) S15 ....5.75
NewCastle,Pa. B1, E5..5.45
NewHaven,Conn. A7 ...6.20
NewHaven,Conn. D2 ...5.90
Pawtucket,R.I. N8, R3..6.10
Pittsburgh J5 .....5.45
Riverdale,Ill. A1 .....5.70
Rome,N.Y.(29) R6 ....5.45
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2 ..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ....5.90
Warren,O.(40) T5 .....5.45
Warren,O. B9, R2 .....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. W19 ...7.05
Worcester,Mass. A7 ....6.30
Youngstown C8, Y1 ....5.45

STRIP, Cold-Rolled Alloy Steel
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 .....13.65
Harrison,N.J. C18 .....12.00
Pawtucket,R.I.(11) NS 12.15
Pawtucket,R.I.(12) NS 12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ....12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy
Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.35
Lackawanna,N.Y. B2 ...8.15
Pittsburgh J5 .....7.80
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. B2..8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 ....8.15
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 .....6.05

STRIP, Electrogalvanized
Dover,O. G6 .....5.45
Warren,O. B9, T5 .....5.45
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP
Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American CladmetalsCo.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 ElectroMetallurgicalCo.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel&Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RellianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible SteelCo.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7		8.00	8.60	10.55	12.85
Bridgeport,Conn.(10) S15	5.45	7.65	8.60	10.55	12.85
Bristol,Conn. W1			8.90	10.85	
Carnegie,Pa. S18		7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich. D3	5.65	7.85	8.80		
Detroit D2	*5.65*	*7.85*	*8.80*	*10.55*	
Dover,O. G6	5.45	7.65	8.60	10.55	12.85
FranklinPark,Ill. T6	5.70	7.80	8.75	10.70	13.00
Harrison,N.J. C18			8.90	10.85	13.15
Indianapolis C8		7.80	8.60	10.55	
Mattapan,Mass. T6	6.10	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15	5.75	7.65	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60		
NewCastle,Pa. E5	5.45	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	*5.90*	*7.95*	*8.90*	*10.85*	
NewYork W3		7.95	8.90	10.85	13.15
Pawtucket,R.I.(11) N8		7.65	8.60	10.55	12.85
Pawtucket,R.I. (12) N8	6.10	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5		7.95	8.90	10.85	13.15
Wallingford,Conn. W2	5.90	7.95	8.90	10.85	13.15
Warren,O. T5	5.45	7.65	8.60	10.55	12.85
Weirton,W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass. A7	6.30	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.10	7.95	8.90	10.85	13.15
Youngstown C8		7.65	8.60	10.55	12.85
Spring Steel (Tempered)					
Buffalo W12			12.50		
Bristol,Conn. W1			12.50	15.00	
FranklinPark,Ill. T6			13.25	15.75	18.75
Harrison,N.J. C18			12.50	15.00	18.00
NewYork W3			12.50	15.00	18.00
Trenton,N.J. R5			12.50	15.00	18.00
Worcester,Mass. T6			12.50	15.00	18.00
Worcester,Mass W12			12.50		
Youngstown C8			12.50	15.00	18.00

SILICON STEEL

H.R. SHEETS (22 gage) (Cut Lengths)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom,W.Va. W10			8.75	9.75	10.65
Brackenridge,Pa. A4			8.75	9.75	10.65
IndianaHarbor,Ind. I-2	7.85	8.15	8.75	9.75	
Mansfield,O. E6	7.85	8.15	8.75	9.75	10.65
Newport,Ky. N9	7.85	8.15	8.75	9.75	10.65
Niles,O. N12	7.85	8.15	8.75	9.75	
Vandergrift,Pa. U5		8.15	8.75	9.75	10.65
Warren,O. R2	7.85	8.15	8.75	9.75	
Zanesville,O. A10		8.15	8.75	9.75	10.65

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semi processed ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
GraniteCity,Ill. G4	8.25*	8.60*	9.20*	10.20*	
IndianaHarbor,Ind. I-2	8.05	8.40*	9.00*		
Vandergrift,Pa. U5	8.05*	8.90	9.50	10.50	11.40
Warren,O. R2	8.05†	8.90	9.50	10.50	11.40

H.R SHEETS (22 Gage) (Cut Lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.60	12.15	12.65	13.65
Brackenridge,Pa. A4	11.60			
Newport,Ky. N9	11.60			
Vandergrift,Pa. U5	11.60	12.15	12.65	13.65
Zanesville,O. A10	11.60	12.15	12.65	13.65

C.R. COILS & CUT LENTGHS (22 Ga.)	T-100	T-90	T-80	T-73	T-72
Butler,Pa. A10			16.25	16.75	
Vandergrift,Pa. U5	13.65	14.65	16.25	16.75	12.35‡
Warren,O. R2					12.35‡

*Semiprocessed. †Fully processed only. ‡Coils annealed; semiprocessed ½c lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va.W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville, O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

WIRE

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Alton,Ill. L1	5.70
Atlanta A11	5.725
Bartonville,Ill. K4	5.675
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20, R2	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala T2	5.525
Fostoria,O. (24) S1	5.75*
Houston S5	5.925
Jacksonville,Fla. M8	6.05
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill.(1) N15	5.525
Struthers,O. Y1	5.525
Waukegan,Ill A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
LosAngeles B3	7.875
Millbury,Mass.(12) N6	7.225
Minnequa,Colo. C10	7.175
Monessen,Pa. P7, P16	6.925
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
RoeblingN.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt., Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.80
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving(8"Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.65
Fostoria,O. S1	10.55
Jacksonville,Fla. M8	11.08
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Minnequa,Colo. C10	10.30
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7,T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Buffalo W12	9.50
Johnstown,Pa. B2	9.50
Minnequa,Colo. C10	9.625
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.50
SparrowsPt.,Md. B2	9.60

ROPE WIRE	(A)
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.55
Roebling,N.J. R5	12.85

WIRE,Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massilon,O. R8	7.45
Monessen,Pa. P7, P16	7.45
Pawtkt.,R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld. Galv.
Ala.City R2	6.675 7.075**
Aliquippa J5	6.675 7.20*
Atlanta A11	6.775 7.30
Bartonville(48)K4	6.775 7.275
Buffalo W12	6.675 7.075†
Cleveland A7	6.675 ....
Crawfordsville M8	6.775 7.30
Donora,Pa. A7	6.675 7.075†
Duluth,Minn. A7	6.675 7.075†
Fairfield T2	6.675 7.075†
Houston,Tex. S5	7.075 7.475
Jacksonville,Fla. M8	7.20 7.73
JohnstownB2(48)	6.675 7.225*
Joliet,Ill. A7	6.675 7.075†
KansasCity,Mo.S5	7.275 7.675
Kokomo C16	6.775 7.175†
LosAngeles B3	7.625 ....
Minnequa C10	6.925 7.325**
Monessen P7(48)	6.675 7.225
Palmer W12	6.975 7.375†
Pitts.,Calif. C11	7.625 8.025†
Portsmouth,O.P12	6.675 ....
Rankin A7	6.675 7.075†
So.Chi'go R2	6.675 7.075**
S.S.Frn.(48)C10	7.625 8.025**
Spar'wsPt.B2(48)	6.775 7.325*
Steri'g(1)(48)N15	6.675 7.175
Struthers,O. Y1	6.675 7.175
Worcester A7	6.975 ....

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga.	Col.
Ala.City,Ala. R2	140**
Ala.City, 17 ga. R2	235**
Ala.City 18 ga. R2	245**
Aliq'ppa,Pa.9-14½ga. J5	143*
Atlanta A11	145
Bartonville,Ill. K4	144
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga.,6"B2	234
Johnstown 4" B2	237
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142†
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	142

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	173
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

WIRE, Barbed	Col.
AlabamaCity R2	153**
AliquippaJ5	150*
Atlanta A11	158
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	158
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156*
Joliet,Ill. A7	153†
KansasCity,Mo. S5	165
Kokomo,Ind. C16	155†
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153**
S.SanFrancisco C10	176**
SparrowsPoint,Md. B2	158*
Sterling,Ill. (1) N15	155

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WIRE, (16gage)	An'ld. Galv. Stone Stone
Ala.City R2	12.50 14.05**
Aliquippa J5	12.50 14.30*
Bartonville K4	12.60 14.35
Buffalo W12	12.50 ....
Cleveland A7	12.50 ....
CrawfordsvilleM8	12.50 14.30
Fostoria,O. S1	12.60 14.15
Johnstown B2	12.50 14.35*
Kokomo C16	12.60 14.15†
Minnequa C10	12.75 14.45**
Palmer,Mas.W12	12.50 14.05†
Pitts.,Calif. C11	12.85 14.40†
SparrowsPt. B2	12.60 14.45*
Sterling(1) N15	12.60 14.25
Waukegan A7	12.50 14.05†
Worcester A7	12.80 ....

* Based on 11c zinc; † 5c zinc; ** Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	131
Aliquippa,Pa. J5	131
Atlanta A11	133
Bartonville,Ill. K4	133
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt., Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, CUT (100 lb keg) To dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	135
Bartonville,Ill. K4	135
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
SparrowsPt., Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	145
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	145
Williamsport,Pa. S19	148

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	—2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	...
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	1.5	19.75	3.5	22.25	6.0	23.75	7.5	23.75	7.5	23	7.5	25.5	6.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 ($)	...	...	...	...	...	...	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
Benwood, W. Va. W10(††)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	19.5	34.75	20.25
Butler, Pa. F6	26.5	—1.75	19.5	+2.75	12.5	+6.25	...	...	...	...	...	...	...	...	...	...
Etna, Pa. N2 (†)	...	...	...	...	...	...	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fairless, Pa. N3	...	...	...	...	...	...	24.25	..	27.25	..	29.75	..	32.25	....	32.75	....
Fontana, Calif. K1 ($)	...	...	...	...	...	...	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)	...	...	...	...	...	...	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	...	...	...	...	...	...	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (‡)	26.5	—0.25	19.50	+4.25	12.5	+8.5	...	...	...	...	...	...	...	...	...	...
Sharon, Pa. M6	...	...	...	...	...	...	26.25	12	29.25	16	31.75	19.5	34.25	20	34.75	21
Sparrows Pt., Md. B2 ($)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (**)	...	...	...	...	...	...	26.25	12	29.25	16	31.75	19.5	34.25	20.0	34.75	21.0
Youngstown Y1 (††)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 ($)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5

Size—Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	...	...	...	...
Alton, Ill. L1 ($)	33.25	18.75	34.75	18	34.75	18	...	...	...	...
Benwood, W.Va. W10(††)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Etna, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fairless, Pa. N3	33.25	....	34.75	....	34.75	....	25.75	....	25.75	....
Fontana, Calif. K1 ($)	22.25	7	23.75	7	23.75	7	...	...	...	...
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	...	...	...	...
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	...	...	...	...
Sharon, Pa. M6	35.25	21.5	36.75	21	36.75	21	...	...	...	...
Sparrows Pt., Md. B2 ($)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	21.5	36.75	21.0	36.75	21.0	27.75	11.5	27.75	11.5
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20	...	...	...	...
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	...	...	...	...

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; ($), 10c to under 11c; (††), 10.50c-11.50c; (**), 9.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollar per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.02	18.44
1¼	13	....	22.53	18.12
1½	13	20.65	24.91	20.01
1¾	13	24.40	29.43	23.66
2	13	27.34	32.98	26.51
2¼	13	30.80	37.15	29.86
2½	12	33.43	40.32	32.41
2½	12	36.82	44.41	35.70
2¾	12	39.87	48.09	38.66
3	12	42.52	51.28	41.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225	....	5.20
Fairfield,Ala. T2				5.20
Gary,Ind. U5	4.325	4.225	4.275	....
Huntington,W.Va. W7				5.20
IndianaHarbor,Ind. I-2	4.325	4.225	4.275	....
Johnstown,Pa. B2				...(16)5.20
Lackawanna,N.Y. B2	4.325	4.225	....	5.20
Minnequa,Colo. C10	4.325	4.125	....	5.70
Steelton,Pa. B2	4.325	4.225	....	....
Williamsport,Pa. S19	....	....	....	5.20

TIE PLATES	
Fairfield,Ala. T2	5.125
Gary,Ind. U5	5.125
Ind.Harbor,Ind. I-2, Y1	5.125
Lackawanna,N.Y. B2	5.125
Minnequa,Colo. C10	5.125
Pittsburg,Calif. C11	5.275
Seattle B3	5.275
Steelton,Pa. B2	5.125
Torrance,Calif. C11	5.275

TRACK BOLTS (20) Treated	
Cleveland R2	11.00
KansasCity, Mo. S5	11.00
Lebanon,Pa. B2	11.00
Minnequa,Colo. C10	11.00
Pittsburgh O3, P14	11.00

JOINT BARS	
Bessemer,Pa. U5	5.275
Fairfield,Ala. T2	5.275
Ind.Harbor,Ind. I-2	5.275
Joliet,Ill. U5	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Steelton,Pa. B2	5.275

AXLES	
Ind.Harbor,Ind. S13	6.50
Johnstown,Pa. B2	6.50

STANDARD TRACK SPIKES	
Fairfield,Ala. T2	7.05
Ind.Harbor,Ind. I-2, Y1	7.05
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.05
Minnequa,Colo. C10	7.05
Pittsburgh J5	7.05
Seattle B3	7.55
So.Chicago,Ill. R2	7.05
Struthers O. Y1	7.05
Youngstown R2	7.05

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in. larger 5.90c
½-in. under ....26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	4
⅝-in. & ⅞-in.	5
1-in. and larger	3
Longer than 6 in.:	
All diams.	+4
Lag bolts, all diams.:	
6 in. and shorter	12
Over 6 in. long	8
Ribbed Necked Carriage	5
Blank	2
Plow	25
Step, Elevator, Tap and Sleigh Shoe	12
Tire Bolts	List
Boiler & Fitting-Up Bolts	25

NUTS

H.P. & C.P., regular & heavy:	
Square, all sizes	5
H.P. Hex, regular & heavy:	
⅝" and smaller	5
¾" to 1⅛", inclusive	6
1¼" to 1½", inclusive	6
1⅝" and larger	5
C.P. Hex, regular & heavy:	
All sizes	5
Hot Galv. Nuts (all types):	
¾" and smaller	4
⅞" to 1½", inclusive	4
Finished Hex Nuts:	
New standard, all sizes	5
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	5

SQUARE HEAD SET SCREWS

(Packaged, per cent off list)

1 in. diam. x 6 in. and shorter	3
1 in. and smaller diam. x over 6 in.	2

HEADLESS SET SCREWS

(Packaged, per cent off list)

No. 10 and smaller	3
¼-in. diam. & larger	1
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5 & 10
Plated finishes	30 & 10

HEXAGON CAP SCREWS

(1020 steel, packaged, per cent off list)

6 in. or shorter:	
⅝-in. & smaller	3
⅞-in. through 1 in.	2
Longer than 6 in.:	
⅝-in. and smaller	2
⅞-in. through 1 in.	7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge Iron:	
98+% Fe, annealed	18.00
Unannealed:	
Minus 100 mesh	14.50
Minus 35 mesh	10.50
Minus 20 mesh	10.00
Swedish, c.i.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N.J., in bags	11.25
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	23.00
Annealed, 99.5% Fe	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe) (minus 325 mesh)	53.50
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, freight allowed:	
Carlots	31.00
Ton lots	34.00
Antimony, 5000 lb lots	32.00*
Brass, ¼-ton lots	28.25-37.50†
Bronze, ¼-ton lots	50.00-60.00‡
Copper:	
Electrolytic	13.50*
Reduced	13.50*
Lead	7.50*
Magnesium	54.00-56.00
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	89.50
Nickel-Silver, ¼-ton lots	44.00-49.00§
Nickel-Silver, ¼-ton lots	46.75**
Phosphor Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	8.50*
Stainless Steel, 302	90.00
Tin	64.50*
Zinc, ¼ ton lots	15.00-28.75‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh	4.95
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium, electrolytic 99.5% Cr min	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 29% Zn, 1% Sn. **64% Cu, 18% Zn, 18% Sn.

Footnotes

(1) Chicago, base.
(2) Angles, flat, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16", 1 7/16" to 1 15/16", 4.50c; 1 15/16" to 7 5/16", 4.90c.
(6) Chicago or Burn, base.
(7) To jobbers, 5 cds. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh, base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.141 to 0.249 in.; for gage 0.142 and lighter, 7.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Plate only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 96" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; + to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.55c for H.S.L.A.
(31) Base; deld. within mill county.
(32) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 74" and narrower.
(37) 12 gage & lighter, 66" & narrower.
(38) 14 gage & lighter, 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035", 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(48) 6-7 gage.
(49) 9 pcs; deduct 2 cds for 1 pcs.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	54.25	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L	....	....	52.50	....	....	61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.75	38.25	53.00	39.50	40.75	59.75	71.00
501	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Chatter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	....	....
321	29.30	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	....	....
410	22.90	30.10	....	....
430	22.90	30.10	....	....
Inconel	41.23	54.18	....	165.00
Nickel	37.50	50.90	....	....
Monel	38.90	51.80	....	....
Copper*	....	....	46.00	....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	....	....	46.00	....

*Deoxidized. Production point: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25	5% Cr Hot Work	0.39
Extra Carbon	0.30	W-Cr Hot Work	0.41
Special Carbon	0.355	V-Cr Hot Work	0.42-.43
Oil Hardening	0.37-.390	Hi-Carbon-Cr	0.665-.70

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	3.875
18.25	4.25	1	4.75	....	2.160-2.320
18	4	2	9	....	2.515
18	4	2	....	....	1.640
18	4	1	....	....	1.480
13.5	4	3	....	....	1.735
6.4	4.5	1.9	....	5	1.005-1.055
6	4	3	....	6	1.240
2	1.4	1.2	....	....	0.495
1.5	4	1	....	8.5	0.865-0.895

Tool Steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON

Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity R2	52.38	52.88		
Birmingham R2	52.38	52.88		
Birmingham U6		52.88		
Woodward,Ala. W15	52.38	52.88	56.50†	
Cincinnati, del.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No. Tonawanda,N.Y. T9	....	56.50	57.00	....
Boston, del.	66.65	67.15	67.65	....
Rochester,N.Y., del.	59.02	59.52	60.02	....
Syracuse,N.Y., del.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon,Mich., del.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
New York, del.	....	62.28	62.78	....
Newark, del.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	....	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, del.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
Nevillelsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, del.	57.37	57.87	57.87	58.37
McKeesRocks, del.	57.04	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaco, del.	57.66	58.16	58.16	58.66
Verona,Trafford, del.	58.19	58.69	58.69	59.19
Brackenridge, del.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., del.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	62.50	63.00	63.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	....	....

*Low phos. southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

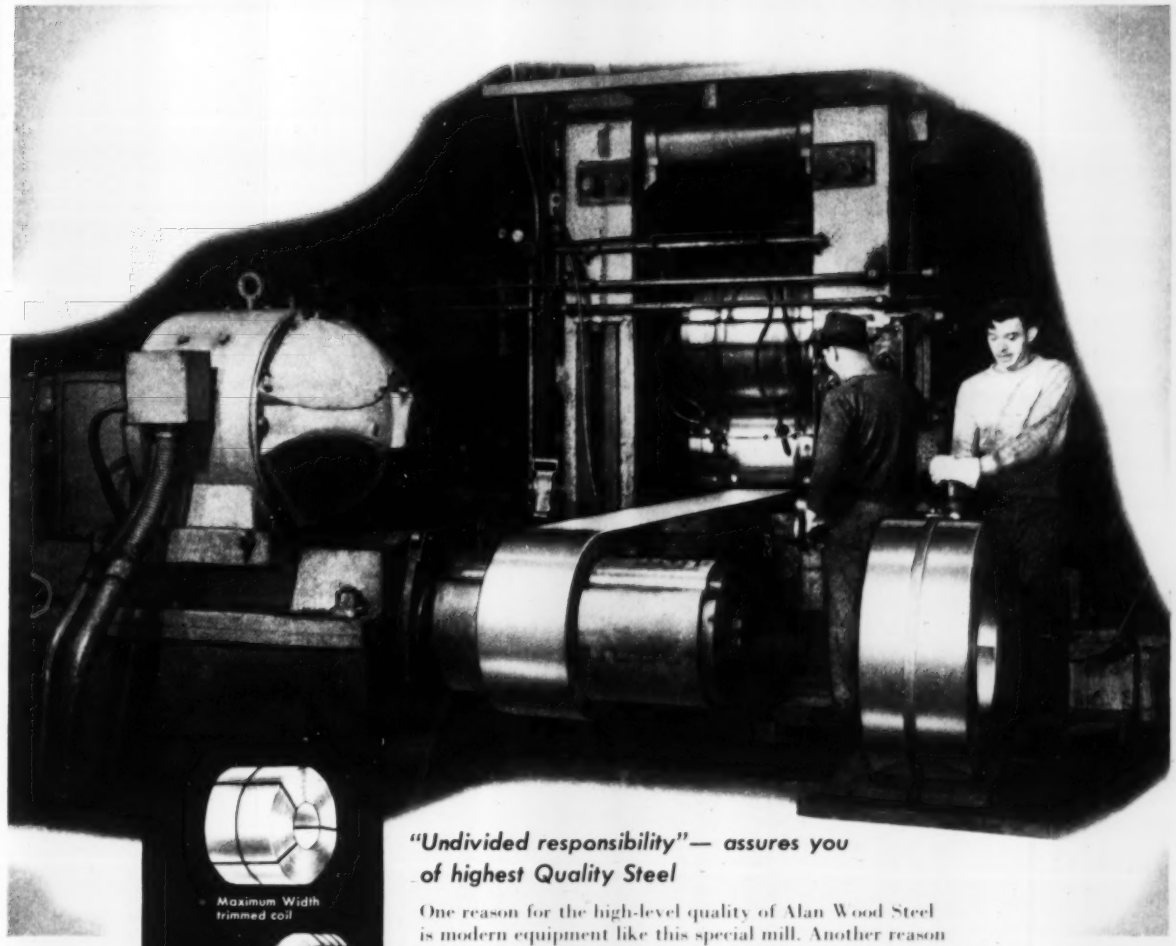
NiagaraFalls, N.Y. P15	$87.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	92.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frt. allowed K2	95.00
Wenatchee,Wash. OH & Fdry, freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

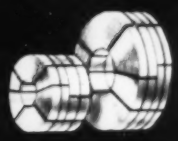
Cleveland, intermediate, A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, del.	64.00
Troy,N.Y. R2	64.00

A.W.
CONTINUOUS MILL

PLATE • SHEET • STRIP—*available in hot rolled quality*



Maximum Width trimmed coil



Bundle showing 2 widths

Bundle slit to 4 widths

More than a century and a quarter of iron and steel making experience

"Undivided responsibility"— assures you of highest Quality Steel

One reason for the high-level quality of Alan Wood Steel is modern equipment like this special mill. Another reason is our policy of undivided mine-to-mill responsibility, and rigid metallurgical control that guarantees your getting the finest quality steel possible to produce . . . and getting *exactly* what you want. Coils are finished with either mill edge or slit edge in widths up to 25½ inches, in thicknesses up to .1875 inches. Coils can also be slit to any desired widths from minimum width 1 inch to maximum width 25½ inches.

Our plant location at the center of Eastern industry and transportation also makes possible faster delivery at favorable freight rates.

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PA.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Erie, Cincinnati, St. Paul, 15 cents, Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††°		Carbon	Floor
Baltimore	6.20	7.12	7.36	7.00	...	6.86	8.17§	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	7.00§	6.30	...	6.15	8.90	....	6.35	6.35	8.25
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	8.65	6.79	...	6.35	7.70	12.17	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	7.95	6.42	....	6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	7.95	6.72	...	6.58	7.66	12.17	6.93	6.80	7.88
Cleveland	6.18	7.12	7.90	6.58	..	6.34	7.40	11.89	6.79	6.50	7.79
Detroit	6.38	7.31	8.22	6.71	7.36	6.56	7.60	12.12	6.93	6.80	7.80
Erie, Pa.	6.13	...	8.15	6.38	....	6.23	7.50°	....	6.50	6.36	7.79
Houston	7.15	7.60	9.40	7.45	9.30	7.45	9.30	....	7.35	7.20	8.55
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.25	8.12	6.59	...	6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.35	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.78	7.75	8.37	7.16	...	7.06	8.42§	12.14	6.99	6.99	8.30
Norfolk, Va.	6.90	...	...	7.20	...	7.20	8.50	....	7.20	7.15	7.85
Philadelphia	6.35	7.13	8.16	7.02	8.80	6.87	8.19§	11.89	6.67	6.63	7.65**
Pittsburgh	6.18	7.12	8.00	6.55	...	6.28	7.65	11.89	6.46	6.33	7.46
Portland, Oreg.	7.90	8.45	9.15	7.65	...	7.35	10.65	....	7.25	7.30	9.15
Richmond, Va.	6.50	7.45	8.00	7.10	...	7.05	7.95	....	7.10	6.85	8.10
St. Louis	6.48	7.42	8.25	6.72	...	6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.84	7.78	8.66	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	9.30	7.60	...	7.15	9.75	13.05	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50	7.50	7.60	9.40
Spokane	8.15	9.40§	9.80	7.60	..	7.60	10.55§	14.15	7.25	7.35	9.40
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; †prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡includes 35-cent special bar quality extra; §as rolled; **¼-in. and heavier, add 0.35c for 12 gage and lighter. ††as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; ° 500 to 9999 lb; §—1000 to 1999 lb; *—1000 lb and over; †—1500 lb to 3999; ‡—under ½ in.

Warehouse Business Highly Competitive

Absence of active large-scale buying reflected at several points by price weakness. Orders are small individually but are fairly numerous. Seasonal pickup in demand is expected

Philadelphia—Weakness dominates warehouse prices. Base quotations are unchanged at the moment, but there is considerable cutting of extras, particularly quantity extras. Moreover, local distributors are confronted with increasing competition from warehouses in other areas. This is noticeable, especially in such lines as tool steels and stainless steel.

Although highly competitive, business is still fairly good. Trading on a daily basis is at least comparable with February. Orders are smaller but they are more numerous. Actually, the profit in this small business, as compared with the large-sized orders, is tending to offset some of the adverse effects resulting from the cutting of extras in various instances.

Cleveland—Seasonal revival in demands for building steel are being felt by some warehouses in this district. In general, however, order volume is disappointing, though some distributors report consumers' requirements are somewhat improved as compared with the preceding two months.

Expectations are not much change in demand will develop over the next several weeks. In the main, sellers think April volume will better that of March, largely because they expect the cautious buying policies of consumers, reflected in restricted mill orders, will necessitate fill-in purchasing at warehouses to considerable extent.

Boston—Warehouses are placing meager lots with steel mills. Sheet orders are small. Most distributors are heavily stocked with carbon and specialty grades. Price-minded consumers are buying cold-rolled wasters at 3.95c, Worcester. March volume of distributors has not improved much over last month. Number of orders is maintained, but total tonnage moved shows only slight gain. Stocks of warehouses are balanced in practically all products.

New York—Warehouse distributors looked to the construction industry for some seasonal increase in steel demand. First quarter sales will be

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$4.75	$4.85	$4.75	$5.00
Bar Size Angles	4.39	4.49	4.39	4.67
Structural Angles	4.39	4.49	4.39	4.67
I-Beams	4.39	4.49	4.39	4.67
Wide Flange Beams	4.94	5.02	4.94	5.22
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.87	5.95	5.87	6.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.00	25.70	25.50	26.34
Barbed Wire	6.20	6.30	6.20	6.48
Merchant Bars	4.65	4.75	4.65	4.93
Hot Rolled Bands	4.65	4.75	4.65	4.93
Wire Rods† Thomas Commercial No. 5	4.77	4.84	4.82	5.09
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Channels	4.49	4.59	4.49	4.77
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

disappointing. Business is in small orders which are fairly numerous. Normal mill buyers who sustained warehouse volume with partial requirements during the period of short supply are back with primary producers.

Pittsburgh—Fabricators are waiting until second quarter to rebuild inventories, in the opinion of distributors. Demand is good, but individual orders are for small quantities. Increasing volume is predicted in April.

Tens of thousands of sizes, shapes and grades of steel products are listed in a new 226-page warehouse stocklist and reference guide just published by Jones & Laughlin Steel Corp., Pittsburgh. The book carries a complete listing of items stocked in J. & L.'s nine warehouses located in Chicago, Cincinnati, Detroit, Louisville, Memphis and Nashville, Tenn., New Orleans, New York and Pittsburgh.

Seattle—Warehouses report the season is opening up slowly. However, March business is bettering that of February, buying being in larger individual tonnages. The recent sheet metalworkers' strike adversely affected demand on distributors, and they are hoping approaching contract negotiations with machinists in April and boilermakers in June will not affect operations.

Money is tight, and collections difficult in some instances. Wide flange items are noticeably easier to obtain. Foreign steel is not attracting much attention although European interests are quoting about 1 cent a pound under domestic prices on small reinforcing bar sizes.

Los Angeles—Warehouse activity is gaining. Distributors are well-stocked in all products except wide-flanged beams. With inventories at or close to normal, some warehousemen are shading prices.

Chicago—Warehouse steel sales still provide no clue as to future business activity. Inventories are in excellent condition. Daily sales provide no threat, being well diversified and apparently being acquired for immediate use. Some warehouses, like mills, have put workers on reduced hours.

San Francisco—Warehouses report good demand for structurals. There is tightness in the supply of wide flange beams. There is a sufficiency of other products.

Cincinnati—March, from the warehouse point of view, is going to be a little better month than had been expected. A pickup in business has been noted the last two weeks.

Sheet Demand Continues Disappointing

Buyers still are ordering cautiously, many depending on inventories. Mills now looking to April for pickup in buying, especially by automotive and related interests

Sheet and Strip Prices, Page 132 & 133

Cleveland—Sheetmakers are booking business for April delivery but to date the volume is disappointing. Buyers continue to order cautiously, and it is apparent many are still depending upon inventories accumulated over past months. Mills in this area are to considerable extent dependent upon automotive requirements and there is no getting away from the fact that auto demand has not been up to expectations.

Base prices on sheets continue to hold unchanged. But the mills are absorbing freight in meeting competition and some extras have been adjusted in recent weeks. Effective Mar. 10, Republic Steel Corp. issued a revised card on enameling sheets, replacing one in effect since May 18, 1953.

Boston—Price structure complications involving split tonnage and divided orders adds confusion to the highly competitive flat-rolled distribution. Delivered prices on some specifications are based on equalization at points where the order may not be rolled or finished. More consumer inventories are down to point where buying is closer to actual consumption. Ability to get sheets and strip promptly retards forward buying and is a major factor in adoption of lower inventory policy. Users who were pressing for steel for 60 to 90 day inventory but a few months back are now negotiating on the basis of 30 to 45 days supply.

Except for slightly heavier demand for higher nickel stainless strip, flat-rolled buying is slow. Automotive parts suppliers are without extended backlogs, and, like other shops, are buying carbon sheets sparingly. Cold strip operations are below capacity.

Philadelphia—Sheet buyers, particularly small specialty shops and warehouses, are becoming increasingly secondary material conscious. They are more interested in mill rejects, wasters and waste-wasters hot and cold carbon and galvanized.

In general, sheet business has shown little improvement so far this month, and producers are not much encouraged over the April outlook. Consumer inventories still loom fairly large, although, unquestionably, some stocks have gotten low, and would be built up more rapidly were it not for the known fact mills can make such excellent deliveries.

Needs of commercial refrigeration manufacturers are described as "pretty good", and air conditioning requirements are being stepped up some.

Pittsburgh—An important sheet consumer here states its inventory adjustment should be completed in a month. After this, ordering will be at the same volume as last year. This consumer, together with other sheet users, has been ordering less sheet than it used. Fabricators' inventories continue to move slowly, and production in March trails February totals.

Chicago—Automakers watched last week's annual automobile show here intently to get a better appraisal of what is ahead in their production and sales future over the next few months. If the word is good, sheetmakers expect orders for May delivery to mount, and quickly.

New York—Most sellers report better demand for cold-rolled sheets than for hot. There is much room for improvement in demand for cold-rolled material. Galvanized is showing a fair amount of life, and the recent improvement in nickel chrome stainless sheets is sustained. Electrical sheets are in better inquiry.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 132

Chicago—Inquiry for reinforcing steel is pretty terrific in comparison with most other fields of consumption. Suppliers are so overwhelmed with work to figure that they are obliged to select from them. Despite the strong activity, however, price quotations reflect the intense competition for available business.

Boston—Competition for concrete reinforcing tonnage has softened prices. While few large volume projects are active, multiple-housing requirements being lower, buying in the 100 to 300 ton range is well sustained. Distributors have ample stocks to meet demand. Bridge tonnage leads and is likely to be heavier in second and third quarters.

Seattle—Mill business continues slow. Small jobs are increasing. Contracts of less than 100 tons each total considerable volume. Competition is growing as mill backlogs decline.

Plates . . .

Plate Prices, Page 132

Philadelphia—Plate demand is no more than sustained. March has been written off as a poor month, with little or no gain on a daily average over February. Producers don't see much ahead in the way of improvement for April.

Unquestionably plates are the slowest moving major product in this area. Shipyard demand, sluggish for a long time, is so dull tonnage is virtually negligible. Eventually requirements for the Forrestal type aircraft carrier, awarded Newport News Shipbuilding & Dry Dock Co. a few weeks ago, will become active, but they are not helping 'out the situation at present, and at most represent the only outstanding work.

Railroad demand also is sluggish. Car and locomotive builders have little work on their books, and as for direct miscellaneous steel buying by the railroads, that has come to a practical stop in most instances.

The carriers started to retrench with the downturn in carloadings some time back and have continued to do so ever since. Not only have they virtually stopped buying, but they have deferred many commitments and cancelled some outright. This is the usual policy with the railroads whenever loadings start to skid. General run of tank and boiler business is spotty, with average plate inventories on the high side.

The Claymont, Del., producer closed down the larger of its two mills, the 160-in. mill, Mar. 20 for major repairs. It is scheduled to be down for three weeks. In anticipation of this suspension, the company rolled in advance various commitments that couldn't be handled on its smaller 120-in. mill, and is planning to have this latter mill roll certain new work, where specifications permit, that might normally go to the larger mill.

Boston—Tank shop bookings are heavier, mostly for airfield and service station underground units. Plate orders are held to specific requirements, and, while heavier for light stock, inventories are held to around 30 days. Exceptions are some structural shops where tonnage has been delivered ahead of schedule.

New York—Plate business is spotty. Tank and boiler shops are reducing inventories but have not reached the point where they are doing much replacing. Demand for pressure vessels has picked up and there is a little better inquiry from fabricators. However, demand from shipyards and freight car builders is exceedingly drab. Diesel locomotive business, which has been on a higher level relatively than freight car business, is now down substantially.

Pittsburgh—Increasing construction activity keeps plate mills at nearly-full operations. Some increases in ordering is noted from barge builders.

Chicago—Requirements for plates are holding up better than almost any other steel product. One leading producer in the district lists sheared plates in 8 and 9 weeks delivery. It is a different picture with universal mill plates, however, which can be had for early shipments.

Los Angeles—Plate demand continues to ease with fabricators' inventories substantial. Work schedules have been fairly constant the past six months.

Seattle—Jobs involving plates are increasing and fabricators regard prospects as reassuring. A fuel pipe line from the Canadian side to Ferndale, bids soon, is a major plate job in prospect.

Semifinished Steel . . .

Semifinished Prices, Page 132

Youngstown—District steel ingot operations held at 66 per cent of capacity last week. Youngstown Sheet & Tube Co. started up 3 open-hearth furnaces at its Campbell Works that had been closed more than a week for lack of orders. At Farrell, Pa., Sharon Steel Corp. put an open-hearth back into production. But Republic Steel Corp. took off two open-hearth furnaces at its Youngstown Works and U. S. Steel Corp. closed down a furnace at its Ohio Works.

A wildcat strike at the Youngstown Sheet & Tube Co.'s Campbell Works last week curtailed operations at the No. 2 seamless tube mill and idled about 250 workers. The strikers walked out in a dispute over new work schedules resulting from a company decision to spread work and eliminate overtime. About 250 of the seamless department's 875 workers were reported involved in the change. Operations of the company's Brier Hill Works may be affected unless the dispute is settled quickly. The Brier Hill Works furnishes steel for the seamless tube mills.

Pittsburgh—Further adjustments in semifinished steel inventories forced cutbacks in Pittsburgh district steelmaking operations of U. S. Steel Corp. last week. The corporation took off 2 blast furnaces and 7 open-hearths. One blast furnace and 5 open-hearths were closed down at the Edgar Thomson Works, 1 open-hearth at the Duquesne Works, and 1 at the Donora Works of the American Steel & Wire Division. A blast furnace was taken off at the Clairton Works.

Steel Bars . . .

Bar Prices, Page 132

Boston—Lowest price and best delivery usually are controlling factors in bar procurement. Substantial range of sizes and grades in cold-finished available from mill stock frequently meets requirements. Except for anti-friction bearings, holding up better than average, demand for alloys is slow. Deliveries in larger sizes, also heat-treated and ground stock, are improved. Practically all bar tonnage, alloy and carbon, is price equalized through freight absorption to meet lowest producing points.

New York—One thing about hot carbon bar demand is that when consumers want bars they want them in a hurry, indicating they have let stocks get too low. Up to now at least, producers have been able to provide excellent service. They usually appear able to make shipments within a couple weeks.

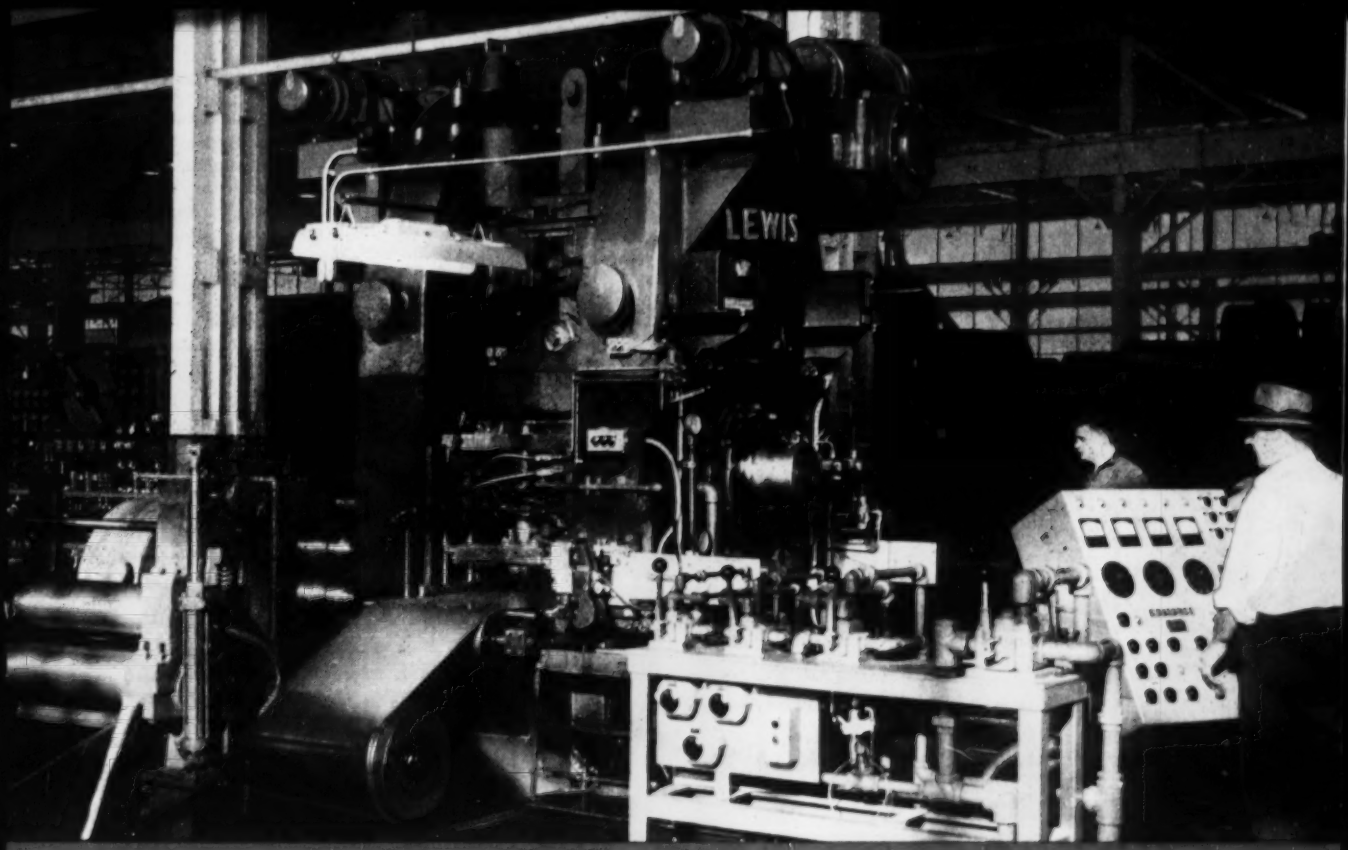
Philadelphia—Hot-rolled carbon bar demand, following a slight improvement recently, has again leveled off, with producers anticipating little change in the near future. Sellers doubt if March business on a daily basis will show much gain over February, and are not at all certain the picture will be altered much in April.

Pittsburgh—Jones & Laughlin Steel Corp. issued revised extras on cold-finished carbon steel bars and shafting superseding the list dated Aug. 5, 1943. The new list includes decreases in some size extras for rounds and hexagons as well as revisions in size extras for flats and squares.

Cleveland—While March demand for bars is somewhat better than that experienced in either February or January, the mills still report sluggish bookings. Inventories of some consumers still are being worked off. At the same time, automotive demands are disappointing, and other consuming lines are largely ordering from month-to-month or against needs immediately in sight.

Cincinnati—Alloy bars continue in plentiful supply here. There has been no appreciable increase in business. Carbon bar sales are holding level. Distributors anticipate a rise in demand within 30 to 60 days.

Chicago—Bar demand maintains a



standard stock items cold re-rolled to customer requirements

Often times a customer wants steel strip that's not a regular stock item . . . such as a different width, gauge, temper or finish. And he wants it fast.

That tough sales situation was solved by a well-known Detroit distributor. They installed a Lewis 10" and 26" x 28" four-high reversing Cold Strip Mill in their warehouse several years ago. The first mill proved so profitable, they have since installed two more.

This Lewis Cold Strip Mill has the capacity for cold reducing hot roll steel strip approximately 25 to 30% maximum per pass . . . starting with 11 gauge stock in any widths up to the capacity of the mill. It readily handles coils weighing 300 pounds per inch of width at mill speeds of 400 to 1000 feet per minute.

Reversing coils permit continuous operation with substantial reductions per pass. Latest type push-button controls maintain close gauge tolerances. These two features, plus the necessary annealing equipment, provide operating setups that are flexible enough to meet all customer requirements.

Although originally designed to meet these special requirements, this mill has proved to be a high-production unit in other services. We'll be glad, at any time, to give you more complete information on design and specifications of this Lewis four-high reversing Cold Strip Mill.

In fact, our experienced engineers and modern manufacturing facilities are always available . . . to help you solve any problem which includes rolling mill machinery.

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soft level and for the first time in many months there is maximum flexibility in rolling schedules. Recent pickup in farm implements is only a ripple in bar output. Eyes are on automotive interests for a clue to May and June bar mill activity. Cold-finishers face the same lack of interest as the producers of hot-rolled bars.

Tool Steel . . .

Tool Steel Prices, Page 146

New York—Shipments of high speed and tool steel (excluding hollow drill steel) in January totaled 8117 net tons, reports the American Iron & Steel Institute. This was a slight increase compared with shipments of 8069 tons in December, but was off sharply from the 9769 tons shipped in January last year.

Of total shipments in January 1272 tons were class A high speed steel, 369 tons class B high speed steel, and 6683 tons other tool steels. This compares with 1327 tons, 285 tons, and 8541 tons, respectively, in the preceding month, and with 1899 tons, 258 tons and 7612 tons, respectively, in January 1953.

Tin Plate . . .

Tin Plate Prices, Page 134

Denver—Pacific Can Co. has purchased 10 acres of land here on which it plans construction of a 62,500 square foot can manufacturing plant. The project will involve investment of about $2 million, according to E. F. Euphrat, president of the company.

Pittsburgh—Production and shipments of tin plate are nearly in balance. During the past month producers trimmed stocks, shipping more than they produced. Indications are April sales will top modest March totals, bringing a healthy increase in production.

Wire . . .

Wire Prices, Page 134

Pittsburgh—Merchants wire sales are improving in farm areas, but volume trails last year. Producers here say sales in eastern states are subject to increasing competition from foreign producers of barbed wire and fence wire.

Boston—Mild improvement in wire orders stems largely from need of inventory fill-ins. Whereas consumers were inclined to defer shipments until recently, more are now advancing delivery. Volume is running close to 10 per cent over the January low, but improvement is gradual. Users of cold heading wire have permitted

inventories to sink to a low point and frequently have to place prompt-shipment orders.

Tubular Goods . . .

Tubular Goods Prices, Page 135

Boston—Direct shipment sales of steel pipe are heavier, notably for airfield fueling systems and utilities. One lot for the Portsmouth, N. H., base involves 500 tons. Potential volume for construction is up, but distributors' sales are slow to improve. Pipe needs for radiant heating installations sharpen competition between wrought iron and steel. Distributors' stocks are well balanced with mill orders geared to replacement only.

Pittsburgh—Standard and line pipe sales continue to improve, partially due to seasonal factors. Welded tube sales are slow. Prospects are brightening for improvement in second quarter.

Pig Iron . . .

Pig Iron Prices, Page 136

Chicago—Both jobbing and captive foundry operations are spotty with comparatively few maintaining full schedules. Many are dependent upon the automotive industry and thus are hoping for a higher level of car assemblies in the next three months. Pig iron shipments pretty well parallel the present melting rate.

Cleveland—With merchant pig iron available for prompt shipment from the blast furnaces, melters are not ordering for inventory to any marked extent. Spotty foundry operations still are reported, some shops doing better than others. This makes for cautious buying, especially with the general business outlook uncertain.

Boston—Pig iron melt is barely holding a four-day week schedule. Foundries are buying hand-to-mouth and few are taking full contract tonnage from the district furnace. Basic melt is well below capacity.

New York—Pig iron buying appears a shade better. Inventories had been permitted to get too low at some foundries.

Operations of the casting shops are undergoing no change and orders for iron are of a rush character. In general, buying is sluggish, not only of domestic but foreign iron as well. Foreign iron at even substantial reductions under the domestic market is attracting little interest. Foreign foundry iron of good grade can be had here under $50 delivered and basic iron at even less—somewhere around $44 f.o.b. cars, eastern seaboard.

Buffalo—Hope is held here for a

half

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CARBON . . . ALLOY . . . LEADED

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In this age of specialization nothing serves like the highly trained craftsmanship and concentrated experience of the specialist. WYCKOFF has specialized in fine quality cold finished steels . . . rounds, squares, hexagons, special shapes, wide flats and precision shafting. When it comes to cold finished steels in these classifications . . . nothing could be finer.

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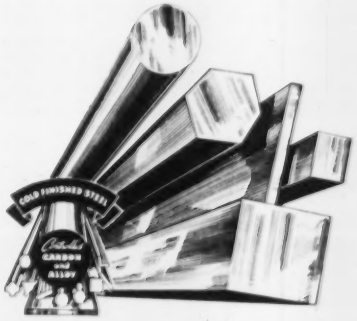

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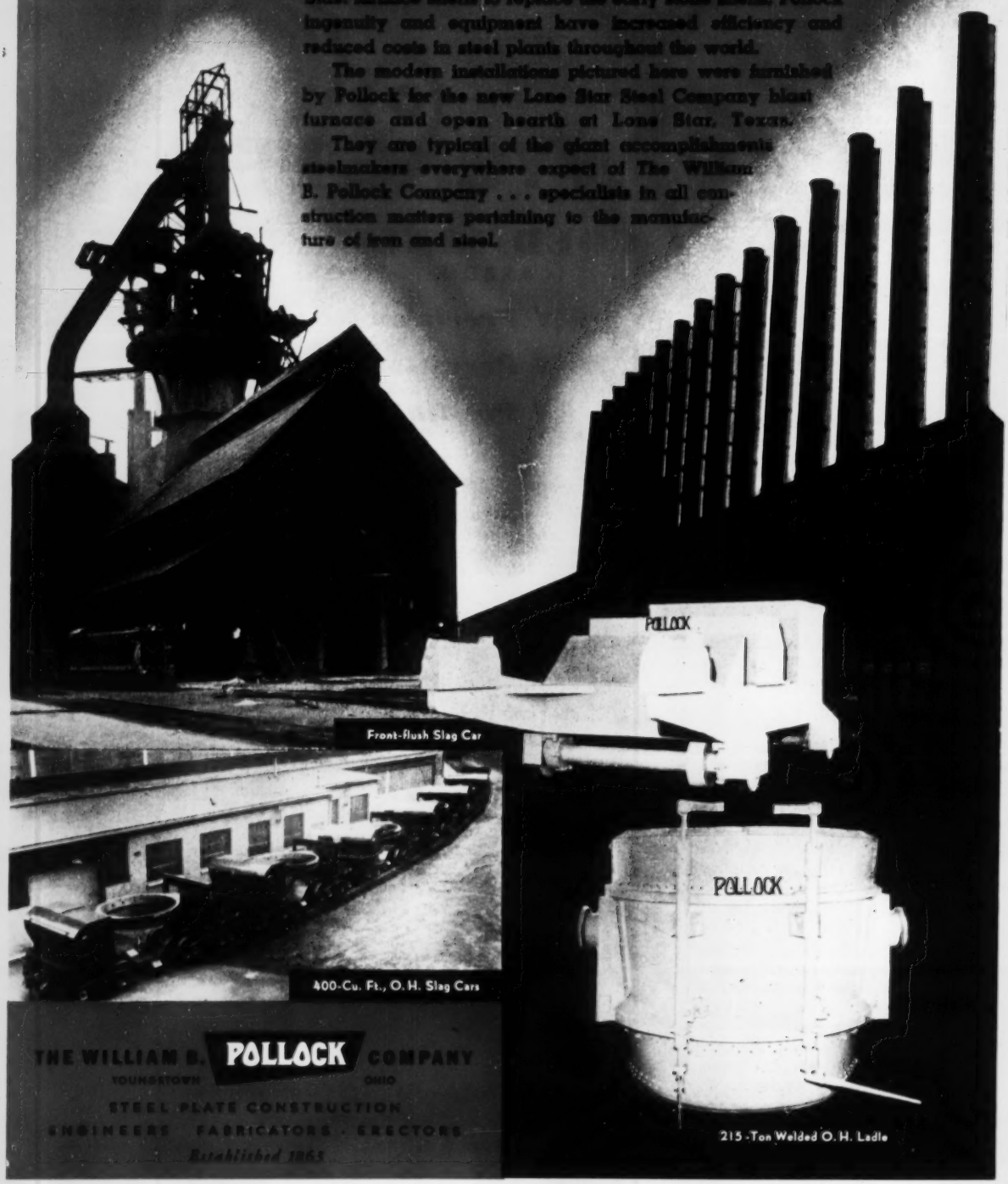
Ever since Pollock designed and built the first steel plate blast furnace shells to replace the early stone shells, Pollock ingenuity and equipment have increased efficiency and reduced costs in steel plants throughout the world.

The modern installations pictured here were furnished by Pollock for the new Lone Star Steel Company blast furnace and open hearth at Lone Star, Texas.

They are typical of the giant accomplishments steelmakers everywhere expect of The William B. Pollock Company . . . specialists in all construction matters pertaining to the manufacture of iron and steel.



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pickup in merchant pig iron demand with the market currently spotty. Foundries continue to operate on sharply reduced production schedules.

Philadelphia — Pig iron trading shows little improvement, and inventories at producing furnaces are growing. As a result, and also because some equipment needs repair, increasing curtailment of pig iron output as it affects shipments into this area is anticipated.

Pittsburgh—Gradual improvement from the January low in pig iron shipments continues. Gray iron foundries have trimmed inventories and are re-entering the market. Ordering by steel foundries continues slow.

Cincinnati—Foundries are buying pig iron as they use it. Prices are firm despite the spread between pig iron and scrap quotations. Farm implement firms are coming back into the market. Automotive demand is mixed, suppliers for the independents finding things slow while foundries doing work for the bigger auto companies are running at a brisk pace.

Los Angeles—Melters' backlogs vary from 1 to 4 weeks. Most foundries are less busy, operating at 65 to 75 per cent of capacity.

Structural Shapes . . .

Structural Shape Prices, Page 132

New York—More structural work is being figured, but for the moment awards are light. Fabricators anticipate more business this month than in either of the preceding two months. Bridge work is beginning to show more life, although this won't be reflected to any great extent in bookings this month.

Boston—Fabricated structural steel in place is increasingly competitive. Backlogs are substantial, but more shops are shipping in excess of tonnage booked. Shop inventories of plain material are ample with stringency in wide-flanged steadily easing. This will be a heavy bridge year, bolstered in second half by tonnage required for the Massachusetts turnpike to the New York state line.

Philadelphia — Structural shapes appear to be moving better than other major products in this district. This does not mean there is any stringency in shapes, except for light wide flange beams, and even these are not too difficult to obtain. Nor does it mean structural activity itself is especially brisk.

Lehigh Structural Steel Co., Allentown, Pa., strikebound since Jan. 4, resumed operations Mar. 15. About

(*Please Turn to Page* 148)

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If miniaturization is a problem
BERYLLIUM COPPER MAY SOLVE IT

THE PROBLEM. Aware of the trend to smaller, lighter products, Edison engineers set out to create the V.P. Voicewriter—a personal dictating machine compact enough for carrying in a brief case, yet sturdy enough to match the performance of larger units. Several of the V.P.'s vital parts presented a serious problem of material selection. Besides meeting the over-all objective of space saving, these parts would be required to have a variety of special properties to facilitate assembly and to maintain Edison's high standards for service-free performance.

THE SOLUTION. Thanks to high strength, versatile Berylco beryllium copper, these critical components do a big job, take up little room in the production model of the V.P. Berylco provided every required feature—both space and performance requirements—in more than adequate measure. And the V.P. was easier to assemble because several of the Berylco parts could be highly stressed without damage.

PERFORMANCE PLUS. Edison selected Berylco beryllium copper not for one valuable property, but many. Conductivity, hardness, stress resistance, wear resistance, nonmagnetic qualities, spring qualities, ability to be fixture heat treated without loss of elasticity—every one was important. In all these requirements Berylco delivers performance *plus*. That's why it has enabled manufacturers of such diverse things as bearings, precision switches, controls and machine tools to make smaller, lighter, more efficient products. Berylco can help you, too. For sample material or engineering assistance, write THE BERYLLIUM CORPORATION, Dept. 16, Reading 19, Pa.

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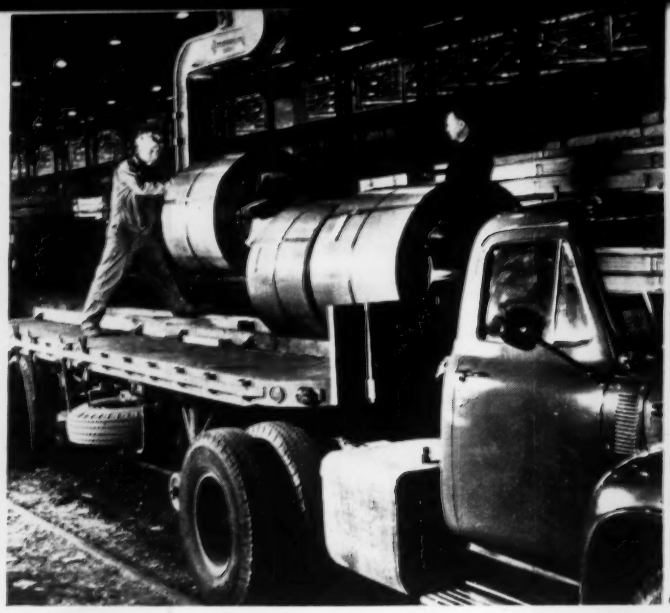

by truck . . .

Pittsburgh Steel's Goal: Making Delivery Meet Your Production Requirements for Hot

Making high quality steel sheet to exacting specifications on special order for many customers, each manufacturing different products, is a complicated job. It takes plenty of headwork to start each order with selected raw materials and deliver the finished sheet to the customer's plant when and how he wants it delivered.

Last summer Pittsburgh Steel Company opened a brand new hot rolled sheet mill at Allenport, Pa., on the Monongahela River near Pittsburgh. Right now, second quarter orders are being booked for cold rolled sheets from the company's new cold mill being readied at the same plant for first production in March. Problems of proving-in these new facilities make production scheduling and deliveries even more difficult.

Yet the schedulers who are teaming up with production and traffic men to carry out this all-important assignment have a lot in their favor.

Pittsburgh Steel is a tightly knit, integrated producer. The close prox-

Incoming Orders from district offices for sheet steel are scheduled by George McLaughlin.

Central Control order scheduling chief, Dan Neuman (center) works out a "toughie" with "Ban" Roberts (right), chief sheet scheduler and his assistant Cecil Carroll (left).

Production Scheduling at both Monessen and Allenport comes under "Don" Shaughnessy.

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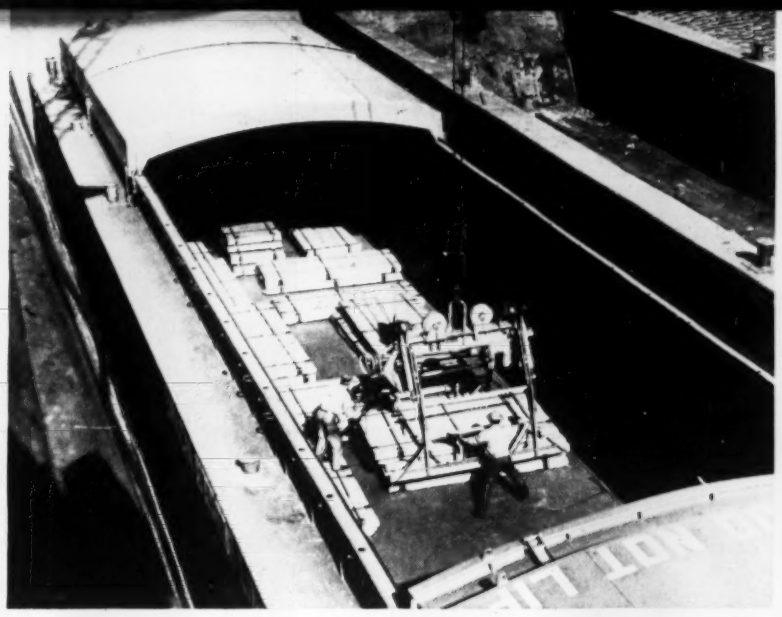

or by barge, here's . . .

Schedules and Cold Rolled Sheets

imity of its plants and central sales control contribute to ease and speed in handling orders. Large enough to produce big tonnages, it is still small enough to have great flexibility.

• **Here's what this means to you**— From the time you place your order with Pittsburgh Steel, until it is delivered to your plant, your order is handled on a more personal basis. Throughout the company—from sales through the scheduling and production departments to traffic—your order gets more individual attention.

Today with steel plentiful and the emphasis on quality and service at the lowest possible price, customers must have accurate information on steel deliveries. They don't want steel coming in ahead of time because it lies around unused, costs extra money. And they don't want it to arrive late because that throws production schedules off and costs still more money.

Pittsburgh Steel men understand and appreciate these problems. Once your order is placed, they go to work conscientiously to fill your requirements. They don't always do the job perfectly. Just as with other producers, errors occur. But through the experience gained during the proving-in period for the hot rolled sheet mill, progress is being made and errors are occurring less frequently.

Above all else, this is the goal: To give you the finest quality hot and cold rolled sheet and strip, and the most dependable service that it is possible to produce with some of the industry's most modern rolling equipment. From the salesman who works directly with you to the last man in the shipping department, Pittsburgh Steel has teamed up to accomplish this goal.

Next time you need flat rolled steel, why not talk to a man from Pittsburgh Steel?

Transportation of the finished product is directed by Larry Weber (left) assistant to general traffic manager, George Dittmar (center) and "Ed" Siemon (right) of traffic department.

Shipping Steel Sheets from the mill at Allenport is the responsibility of "Ed" Fisher.

"Everything New But The Name"

Pittsburgh Steel Company

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Sales Offices in Principal Cities Throughout the Country

(*Concluded from Page* 145)

100 workers, AFL members, engaged in the walkout.

Los Angeles—Demand for structurals is weaker. Fabricators are sharpening pencils as business gets more competitive. Bids for a recent job ranged from $68,000 to $71,000.

Seattle—Pacific Car & Foundry Co., Seattle, booked 2200 tons of gates for The Dalles dam.

Ferroalloys . . .

Ferroalloy Prices, Page 152

New York—The recent government decision to pass on to consumers the 100 per cent bonus on columbium and tantalum ores has made it necessary to increase the price of ferrocolumbium by $3.10 per pound of contained columbium, the Electro-Metallurgical Co., division of Union Carbide & Carbon Corp., announced last week. The new base price for ferrocolumbium is $9.50 per pound of contained columbium, effective Apr. 1 for contract users, and immediately on a spot basis. The bonus has been 100 per cent of the market price of all columbium and tantalum ores. On Feb. 11 the government announced that this bonus which it had been paying would thereafter be passed on to the consumer.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

7000 tons, Grady Hospital buildings, Atlanta, Ga., to Bethlehem Steel Co., Bethlehem, Pa.; Robert E. McKee, Inc., Dallas, Tex., general contractor.

6500 tons, double circuit steel towers, 205-mile transmission line, Central South Dakota, Western Minnesota, Missouri river Basin project, Bureau of Reclamation, to American Bridge Division, U. S. Steel Corp., Denver.

2,500 tons, boiler and turbine building, Connecticut Light & Power Co., Devon, Conn., to Bethlehem Fabricators Inc., Bethlehem, Pa.

2200 tons, gates, appurtenances, etc., The Dalles dam, Oregon, to Pacific Car & Foundry Co., Seattle, Atkinson-Ostrander, joint general contractors.

550 tons, control tower and building, Logan Airport, Boston, to Groisser & Shlager Iron Works, Somerville, Mass.

510 tons, tainter gates and spillway bridge, Connecticut Light & Power Co., Newtown, Conn., to Bethlehem Steel Co., Bethlehem, Pa.

STRUCTURAL STEEL PENDING

16,000 tons, Kingston-Rhinecliff bridge across the Hudson river, New York State Bridge Authority, bids on sub-structure closed Mar. 15; bids for superstructure will come out later; David B. Steinman, New York, consulting engineer.

2000 tons, apartment, Minskoff & Son, lower Fifth avenue, on former Hotel Brevort site, New York city, bids asked.

2700 tons, nine bridges, state thruway, Monroe county, New York, bids Apr. 1.

2300 tons, Larson Air Force Base, Washington state, bids in to U. S. Engineer, Seattle, Mar. 17.

2000 tons, sewerage tunnel, Deer Island, Boston, bids to Metropolitan District Commission, Boston.

1800 tons, estimated, power plant, Long Island Lighting Co., Island Park, Long Island, bids asked.

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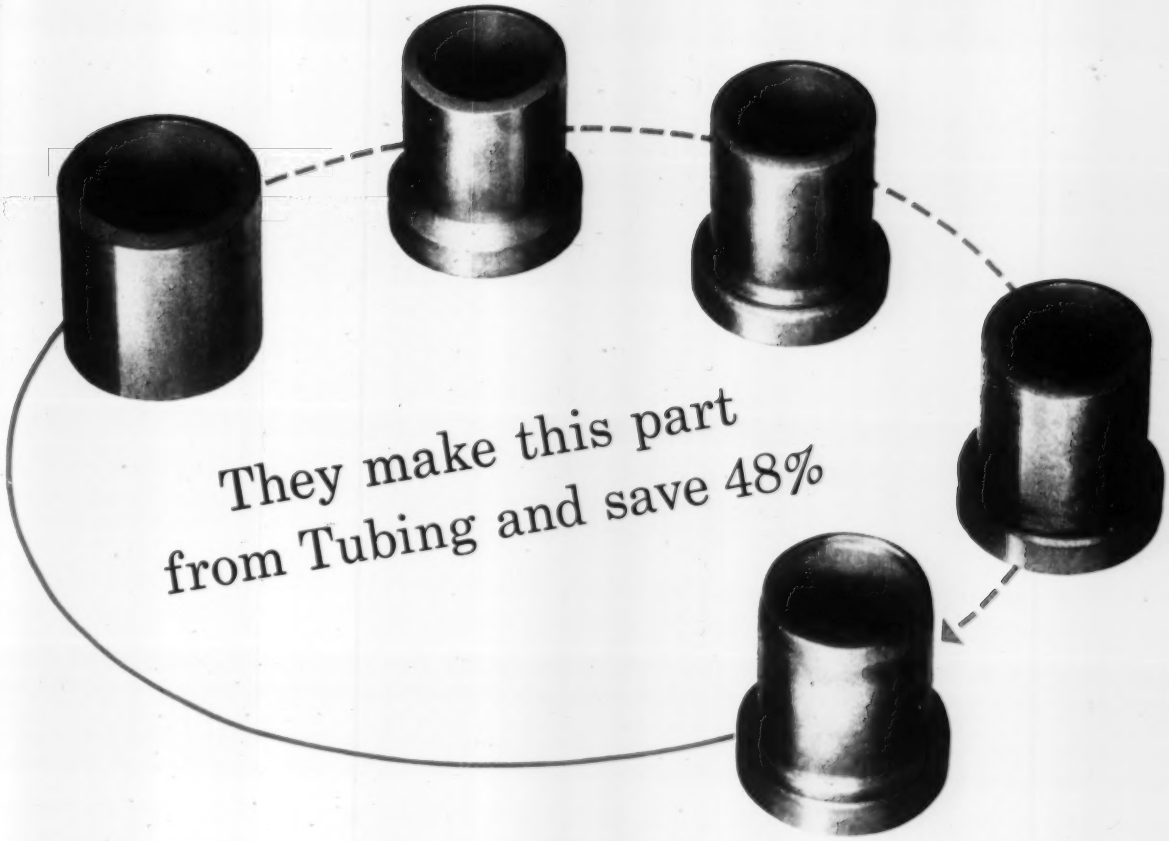

They make this part from Tubing and save 48%

This part used to be made out of solid bar stock on a screw machine. Costly? You bet. 12½ cents each. Lots of expensive machining. Lots of metal wasted to make a hole.

Now, Northwestern Corporation, Morris, Ill., makes it out of tubing. ELECTRUNITE Mechanical Tubing, 1½ O.D. x 11 gage. The customer gets it in 14-foot lengths, cuts it off into 2″ lengths.

Next, the tubes are formed in a series of dies. Pretty drastic reductions, but the ELECTRUNITE Tubing can take it. Then they're machine finished in one operation.

The result: Each part now costs only 6½ cents. Multiply that by several million parts a year the manufacturer produces and you come up with a sizable saving.

Unusual, you say? Not at all. Republic has helped a lot of manufacturers cut costs drastically by helping them design with Republic ELECTRUNITE Tubing. A call to your nearest Republic Sales office will bring you all the facts.

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WHATEVER your metal fabricating needs, chances are you'll solve them best with Cleveland engineered equipment. You can be sure of dependable, economical performance, for all Cleveland machines, both special and standard, benefit by our 75 years of experience in this field.

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(*Concluded from Page 148*)

1200 tons, state highway bridges, Dedham-Westwood-Needham, Mass.; A. V. Taurasi Co., Somerville, Mass., low, general contract.

1100 tons, building, Rust Craft Corp, Dedham, Mass.; Aberthaw Construction Co., Boston, general contractor.

1000 tons, buildings, airfield base, Portsmouth, N. H.

620 tons, state bridge, Westmoreland county, Pennsylvania; bids Apr. 9.

600 tons, addition, Washington Athletic Club, Seattle; bids postponed from Mar. 16 to Mar. 23.

340 tons, medical center building, Yeshiva University, Bronx, New York city, general contractors bids due Mar. 25; Kelly & Gruzen, that city, architects.

260 tons, office, warehouse, garage, PUD No. 1, Everett, Wash.; Newland Construction Co., Everett, low $472,419.

200 tons, state bridges, Fall River expressway, Brockton, Mass.; D. V. Frione & Sons Co., New Haven, Conn., low, general contract.

200 tons, automotive maintenance shop, airfield base, Portsmouth, N. H., George A. Fuller Co., Boston, low, general contract.

160 tons, readiness hangar, McChord Air Field, Washington state; John H. Sellen Construction Co., Seattle, low $295,921.

150 tons, Newberry store, Asbury Park, N. J., bids asked.

Unstated, 3-story addition, communications building, University of Washington, Seattle; bids to Board of Regents, Apr. 27.

Unstated, municipal auditorium, Anchorage, Alaska; Doughty Construction Co., Anchorage, low $362,500.

Unstated, 2400-car parking garage, Seattle; bids from selected contractors, Mar. 26.

Unstated, 3-story steel frame addition to municipal steam power plant; bids to Einar Tonseth, city clerk, Fairbanks, Alaska, Apr. 5; R. W. Beck & Associates, engineers; city will furnish a portion of the steel involved.

REINFORCING BARS . . .

REINFORCING BARS PLACED

135 tons, office building, Worcester Mutual Fire Insurance Co., Worcester, Mass., to Joseph T. Ryerson & Son, Inc., Cambridge, Mass.; E. J. Cross Co., Worcester, general contractor.

108 tons, hospital, Tacoma, Wash., to J. D. English Steel Co., Tacoma.

100 tons, women's dormitory, Tufts College, Somerville, Mass., to Concrete Steel Co., Boston; George B. H. Macomber Co., Boston, general contractor.

REINFORCING BARS PENDING

675 tons, also 88,300-ft precast concrete or welded plate steel pipe, 84 to 60-in.; Wanship dam and acqueduct, Weber Basin project, Northern Idaho; bids to the Bureau of Reclamation, Denver, probably within 30 days.

275 tons, also pumping plants and 26,000 feet 60 to 12-in., reinforced concrete culvert pipe, 70 miles laterals, Columbia Basin project; Bureau of Reclamation will invite bids in late March.

200 tons, Ballard district shopping center, Seattle; general bids in.

100 tons, tank foundations and fire wall, Port of Seattle; general contract to Noble W. White, Seattle, low $49,827.

100 tons, Washington state highway jobs; bids to Olympia, Wash., Mar. 16.

100 tons, including handrails, etc.; highway bridges, Douglas county, Oregon, and Lewis county, Washington; bids to Bureau of Public Roads, Portland, Oreg., Mar. 24 and Mar. 25, respectively.

Unstated, 3-story communications building addition, University of Washington, Seattle; bids Apr. 27.

Unstated, $1 million, 5897-ft highway bridge, Pend Oreille river span; bids to the Highway Commission, Boise, Idaho, Apr. 6.

Unstated, 21 ammunition igloos, Ladd Field, Alaska; bids to U. S. Engineer, Seattle, Apr. 6.

Unstated, 22 ammunition igloos, Elelson Field, Alaska; bids to U. S. Engineer, Seattle, Apr. 9.

Unstated, dormitory, University of Oregon, Eugene, Oreg.; general contract to W. H. Shields Construction Co., Eugene, low $763,986.

Unstated, 6-story addition, Deaconess Hospital, Spokane, Wash.; general contract to Purvis Construction Co., Spokane, Wash., low, $936,260.

Unstated, 100-bed hospital, Fairchild Air Field, Washington state; bids to U. S. Engineer, Seattle, Mar. 16.

PLATES . . .

PLATES PLACED

Unstated, 28 tanks, various sizes for Ferndale, Wash., refinery, General Petroleum Co., to American Pipe & Construction Co., Portland, Oreg.

PLATES PENDING

500 tons or more, 65 bolted, knocked 10,000-barrel steel tanks; bids Mar. 25, supply officer, yards and docks, Navy Department, Port Hueneme, Calif.

200 tons, water storage tank, Bellevue, Wash.; Chicago Bridge & Iron Co., Seattle, low $95,985 and alternative $90,265.

112 tons, water storage tank for Portland, Oreg.; Gunderson Bros. Engineering Co., Portland, low.

100 tons, water tank, bids to Farlington, Oreg., Mar. 31.

100 tons, 200,000-gal. welded standpipe, Newfields, N. H.; bids in.

PIPE . . .

CAST IRON PIPE PLACED

355 tons, 20 and 6-in. for Bellingham, Wash., to U. S. Pipe & Foundry Co., Seattle.

STEEL PIPE PENDING

Unstated, 8000-feet 14-in. fusion weld and fittings; bids to A. E. Harris, clerk, Enterprise, Oreg., Mar. 22.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Pacific of Mexico, four 1600-hp diesel road units to American Locomotive Co., New York.

Southern Pacific, one 50-ton 140-hp diesel unit to General Electric Co., Schenectady, N. Y.

RAILROAD CARS PLACED

Burlington Refrigerator Express Co., 200 fifty-ton steel refrigerator cars to Pacific Car & Foundry Co., Renton, Wash.

Chicago Great Western, 2 seventy-ton tank cars, to American Car & Foundry Co., New York.

Pacific of Mexico, 300 fifty-ton box cars to Pullman-Standard Car Mfg. Co., Chicago, and 60 seventy-ton hopper ballast cars to Magor Car Corp., New York.

Union Refrigerator Transit Lines, 800 forty-ton refrigerator cars, to General American Transportation Corp., Chicago, of which Union Refrigerator is a division.

Western Fruit Express, 250 fifty-ton refrigerator cars to Pacific Car & Foundry Co., Renton, Wash.

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CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.

(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $260, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala., and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. **0.07% C, 27.95c per lb of contained Mn,** carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.60c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max.) Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.4c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Min. carloads, 30c; 2000 lb to min. carloads, 32c; 250 lb to 1999 lb, 34c; less than 250 lb, 37c. Premium for hydrogen-removed metal, 1.5c per lb, f.o.b. cars, Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-86%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. S M x D, bulk, 26.25¢ per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, S M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon: No. 2: (Cr 36-39%, Si 26-39%, Al 7-9%, C 0.05% max). 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14; less ton $1.16. Delivered Spot, add 5c. Prices on 0.10 per cent carbon grade add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c; freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 4.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe) c.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.6c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (19-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contact, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet. Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more, $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max.). Contract, ton lot, 2" x D, $8.50 per lb of contained Cb, less ton $9.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx.; and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb. contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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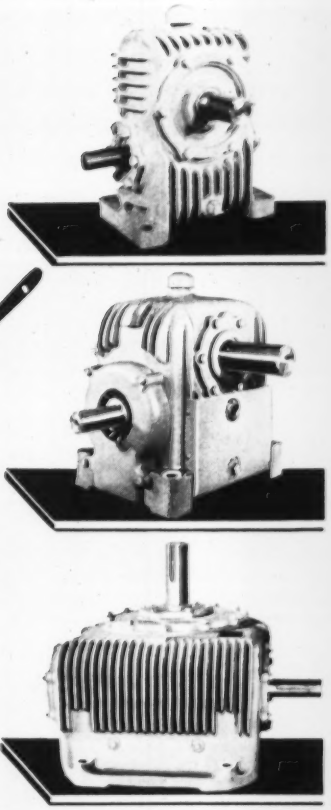

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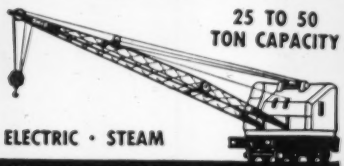

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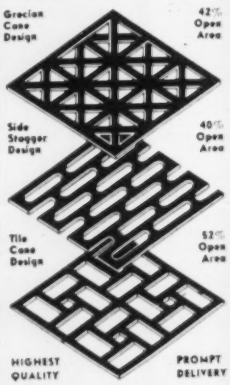

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ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates, contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	22.00
North African hematite (spot)	20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite min. 60%, WO_3	23.80
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, $1.12 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, $1.05-$1.07.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$24.00-$26.00
48% no ratio	34.00

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mb content mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-$15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.00
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Buffalo, deld.	28.08
Flint, deld.	28.23
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$44-$47
Birmingham area	45.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded with nipple, unboxed, f.o.b. plant)

GRAPHITE

Diam., Inches	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	60	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

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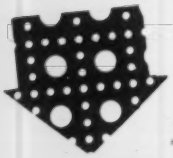

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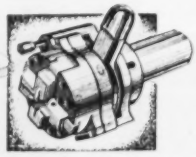

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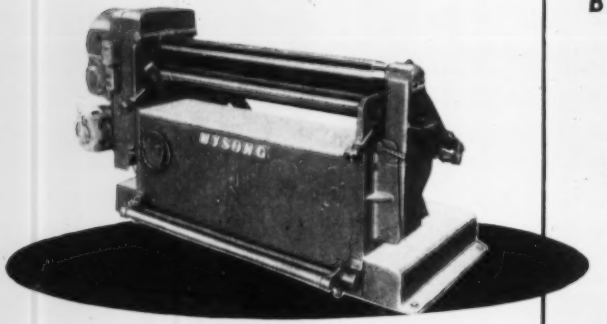

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WYSONG

Wysong and Miles Company, Greensboro, N. C.

Scrap Prices May Be Nearing Bottom

Slightly firmer tone is developing in market at various points despite continued absence of large mill buying. Resistance to further decline now more in evidence

Scrap Prices, Page 158

Cleveland—It begins to look as though the scrap market at last is getting close to bottom. At least the pace of the downturn in prices has noticeably slowed up. Prices on all grades held unchanged here last week for the first time in several months.

This is especially notable in view of the fact that representative mill buying continues absent and steelmaking operations are still tending downward. Ingot operations in this immediate district last week were off another 5 points to 60 per cent of capacity.

At the same time foundry operations in the area are described as spotty. However, demand for cast scrap is fair, reflecting increased use of scrap in foundry melts as result of the more favorable prices on scrap as contrasted with the prevailing quotations on pig iron.

Philadelphia—For the first time in quite a while prices on major openhearth grades of scrap are unchanged. There has been no buying of consequence and sellers have reached the point where they are not disposed to force the issue, at least for the present. Continued shrinkage in steel production in this district, however, promises little pickup in demand in the near future.

The only items that have undergone further price change are electric furnace bundles, which are now holding at $23 to $23.50, delivered, and low phos structurals and plate, which are off $26 to $27 on light trading. This is a drop in both cases.

Boston—Steel scrap buying is slow with prices plumbing low depths. Consumers are working off inventories which remain substantial for current operations. Dealers are taking in little tonnage with yard supplies of prepared and unprepared material large, notably No. 2 bundles. Cast scrap is slow, but prices are more stable, making but slight recovery from low levels. Bridgeport, Conn., steelworks resumed operations Mar. 15 after being down for one week, ending Mar. 13.

Chicago—The scrap market has a slightly firmer tone although buying continues light. A small sale of No. 2 heavy melting steel gave brokers difficulty in delivery. There is a dearth of this grade. Dealers don't have it because it is uneconomical to prepare and handle on present margins. For one thing, little auto wrecking is going on as No. 2 bundles have no market. Cast grades of scrap hold their strength although foundry operations are only slightly improved, and this because of more farm implement activity.

New York—Scrap brokers' prices are nominally unchanged on all grades of carbon steel and cast iron. The market continues weak with trading in carbon steel at a virtual standstill and with only a limited movement in the cast grades.

In stainless scrap, brokers have reduced 18-8 borings and turnings $5 a ton to a range of $75 to $80. The reduction, however, is nominal.

Seattle—Scrap buyers are not actively in the market. They hold comfortable inventories. Prices are unchanged, No. 1 and No. 2 heavy melting grades being quoted $25 and $21, respectively, with No. 1 electric furnace and No. 1 cupola $35.

San Francisco—Dealers' stocks of steel scrap are not building up despite the almost complete absence of mill buying. Generators in outlying districts have been taking a "holiday." There is nothing further in sight on shipments of scrap to Japan from this port.

Los Angeles—Mills continue out of the market. With exception of cast grades, which are moving well, movement of scrap is nil.

Pittsburgh—Declines in steel production extend slowness in the scrap market here. Belief is growing that little scrap can move at prevailing prices. In the absence of activity prices held unchanged last week.

Cincinnati—The undertone of the market appears stronger. It is difficult to buy scrap at the prices quoted. At the moment it is touch and go as to whether dealers will eventually sell at the quoted prices or the mills will increase their offers.

Buffalo—Advancing $2 per ton, cast scrap continues to hold the spotlight in an otherwise desultory

(*Please Turn to Page* 160)

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Mar. 18	$24.33
Mar. 11	24.17
Feb. Avg.	26.91
Mar. 1953	44.05
Mar. 1949	34.60

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	25.00-26.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	25.00-26.00
No. 2 bundles	21.00-22.00
No. 1 busheling	25.00-26.00
Machine shop turnings	12.00-13.00
Mixed borings, turnings	12.00-13.00
Short shovel turnings	16.00-17.00
Cast iron borings	16.00-17.00
Cut structurals	*27.00-28.00*
Heavy turnings	26.00-27.00
Punchings & plate scrap	*27.00-28.00*
Electric furnace bundles	28.00-29.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Charging box cast	33.00-34.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt	27.00-28.00
Rails, 2-ft. and under	43.00-44.00
Rails, 18-in. and under	44.00-45.00
Rails, random lengths	37.00-38.00
Railroad specialties	34.00-35.00

Stainless Steel Scrap

(F.o.b. shipping point)

18-8 bundles & solids	165.00-170.00
18-8 turnings	85.00-90.00
430 bundles & solids	85.00-87.00
430 turnings	60.00-62.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	20.00-21.00
No. 2 heavy melting	18.00-19.00
No. 1 bundles	20.00-21.00
No. 2 bundles	15.00-16.00
No. 1 busheling	20.00-21.00
Machine shop turnings	8.00-9.00
Mixed borings, turnings	12.00-13.00
Short shovel turnings	12.00-13.00
Cast iron borings	12.00-13.00
Low phos.	22.00-23.00
Alloy free, short shovel turnings	13.00-14.00
Electric furnace bundles	20.00-21.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Charging box cast	23.00-24.00
Stove plate	33.00-34.00
Heavy breakable cast	22.00-23.00
Unstripped motor blocks	21.00-22.00
Brake shoes	27.00-28.00
Clean auto cast	38.00-39.00
No. 1 wheels	30.00-31.00
Burnt cast	27.50-28.50
Drop broken machinery	38.00-39.00

Railroad Scrap

No. 1 R.R. heavy melt	25.00-26.00
R.R. malleable	38.00-39.00
Rails, 3-ft. and under	41.00-42.00
Rails, 18 in. and under	44.00-45.00
Rails, random lengths	37.00-38.00
Cast steel	32.00-33.00
Railroad specialties	32.00-33.00
Uncut tires	34.00-35.00
Angles, splice bars	38.00-39.00
Rails, rerolling	38.00-39.00

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	23.00-24.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	23.00-24.00
No. 2 bundles	18.00-19.00
Machine shop turnings	9.00-10.00
Short shovel turnings	15.00-16.00
Cast iron borings	15.00-16.00
Low phos.	25.00-26.00
Electric furnace bundles	24.00-25.00

Railroad Scrap

No. 1 R.R. heavy melt.	26.00-27.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	22.00-
No. 2 heavy melting	20.00
No. 1 bundles	22.00
No. 2 bundles	18.00
No. 1 busheling	22.00*
Electric furnace bundles	*23.00-23.50*
Machine shop turnings	11.00
Mixed borings, turnings	11.00
Short shovel turnings	16.00*
Structurals & plate	*26.00-27.00*
Heavy turnings	20.00
Couplers, springs, wheels	30.00
Rail crops 2 ft. & under	40.00

Cast Iron Grades

No. 1 cupolas	34.00-35.00
Malleable	38.00-39.00
Heavy breakable cast	36.50-37.50
Unstripped motor blocks	28.00*
Drop broken machinery	40.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	13.00-14.00
No. 2 heavy melting	11.00-12.00
No. 1 bundles	13.00-14.00
No. 2 bundles	9.00-10.00
Machine shop turnings	4.00*
Mixed borings, short turnings	6.00*
Low phos. (structural & plate)	20.00
Short shovel turnings	8.00-9.00*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00*

Stainless Steel

18-8 sheets, clips, solids	160.00-165.00
18-8 borings, turnings	*75.00-80.00*
430 sheets, clips, solids	40.00
410 sheets, clips, solids	30.00

*Nominal.

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*13.25-15.00*
No. 2 heavy melting	*9.25-11.25*
No. 1 bundles	*13.25-14.25*
No. 2 bundles	*7.25-9.25*
Machine shop turnings	3.00-3.50
Mixed borings, turnings	3.00-3.50
Short shovel turnings	*6.50-7.00*
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-37.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	22.00-23.00
No. 2 heavy melting	18.00-19.00
No. 1 bundles	22.00-23.00
No. 2 bundles	16.00-17.00
No. 1 busheling	22.00-23.00
Machine shop turnings	*8.00-9.00*
Mixed borings, turnings	10.00-11.00
Short shovel turnings	10.00-11.00
Cast iron borings	10.00-11.00
Low phos., 18-in.	29.00-30.00

Cast Iron Grades

No. 1 cupola	35.00
Heavy breakable cast	29.00
Charging box cast	30.00
Drop broken machinery	40.00

Railroad Scrap

No. 1 R.R., heavy melt.	25.00-26.00
Malleable	32.00-33.00
Rails, 18-in. and under	42.00-43.00
Rails, random lengths	34.00-35.00

CHICAGO

No. 1 heavy melting	*25.00-26.00*
No. 2 heavy melting	21.00-22.00
No. 1 factory bundles	26.00-27.00
No. 1 dealer bundles	23.00-24.00
No. 2 bundles	*17.00-19.00*
No. 1 busheling	24.00-26.00
Machine shop turnings	9.00-10.00
Mixed borings, turnings	9.00-10.00
Short shovel turnings	11.00-12.00
Cast iron borings	11.00-12.00
Cut structurals, 3-ft.	29.00-30.00
Punching & plate scrap	29.00-30.00
Electric furnace bundles	28.00-29.00

Cast Iron Grades

No. 1 cupola	*32.00-34.00*
Stove plate	27.00-28.00
Unstripped motor blocks	*22.00-23.00*
Clean auto cast	*36.00-38.00*
Drop broken machinery	36.00-38.00

Railroad Scrap

No. 1 R.R. heavy melt	28.00-29.00
R.R. malleable	37.00-38.00
Rails, 2-ft. and under	*40.00-41.00*
Rails, 18-in. and under	*41.00-42.00*
Angles, splice bars	35.00-36.00
Rails, rerolling	36.00-37.00

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	42.00
430 turnings	22.00-25.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	16.00
No. 2 heavy melting	14.50
No. 1 bundles	17.00
No. 2 bundles	14.50
No. 1 busheling	17.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings	8.00
Punchings & plate scrap	19.00

Cast Iron Grades

No. 1 cupola	36.00
Charging box cast	25.00
Stove plate	28.00
Heavy breakable	25.00
Unstripped motor blocks	18.00
Clean auto cast	40.00
Malleable	28.00

BUFFALO

No. 1 heavy melting	23.50-24.50
No. 2 heavy melting	20.50-21.00
No. 1 bundles	23.50-24.50
No. 2 bundles	18.50-19.00
No. 1 busheling	23.50-24.50
Machine shop turnings	11.00-12.00
Mixed borings, turnings	13.00-13.50
Short shovel turnings	13.00-13.50
Cast iron borings	13.00-13.50
Low phos.	27.50-28.50

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*33.00-34.00*
No. 1 machinery	*37.00-38.00*

Railroad Scrap

Rails, random lengths	31.50-32.50
Rails, 2-ft. and under	36.50-37.50
Railroad specialties	34.50-35.50

BIRMINGHAM

No. 1 heavy melting	19.00-20.00
No. 2 heavy melting	17.00-18.00
No. 1 bundles	19.00-20.00
No. 2 bundles	*15.00-16.00*
No. 1 busheling	19.00-20.00
Cast iron borings	*13.00-14.00*
Short shovel turnings	14.00-15.00
Machine shop turnings	12.00-13.00
Electric furnace bundles	*25.00-26.00*

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	39.00-40.00
Charging box cast	28.00-29.00
Stove plate	36.00-37.00
Bar crops and plate	*28.00-29.00*
Structural, plate 2 ft.	28.00-29.00
Heavy breakable cast	28.00-29.00
Unstripped motor blocks	32.00-33.00
No. 1 wheels	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	*23.00-24.00*
Rails, 18 in. and under	39.00-40.00
Rails, random lengths	*32.00-33.00*
Angles, splice bars	*35.00-36.00*
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	24.00
No. 2 heavy melting	22.00
No. 1 bundles	24.00
No. 2 bundles	19.00
Machine shop turnings	6.00
Short shovel turnings	8.00

Cast Iron Grades

No. 1 cupola	35.00
Charging box cast	26.00
Heavy breakable cast	23.00
Unstripped motor blocks	23.00
Brake shoes	30.00
Clean auto cast	37.00
Stove plate	27.00

Railroad Scrap

No. 1 R.R. heavy melt.	29.00
Rails, 18-in. and under	36.00
Rails, random lengths	33.00
Rails, rerolling	35.00
Uncut tires	30.00
Angles, splice bars	33.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	25.00
No. 2 heavy melting	21.00
No. 1 bundles	22.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turnings	11.50
Mixed borings, turnings	11.50
Short shovel turnings	11.50
Electric furnace, No. 1	35.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	35.00-37.00
Heavy breakable cast	25.00-32.00
Unstripped motor blocks	23.00
No. 1 wheels	38.00-40.00
Stove plate (f.o.b. plant)	29.00

Railroad Scrap

(Delivered consumer plant)

Rails, random lengths	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings	5.00
Cast iron borings	5.00
Cut structurals	25.00
Heavy turnings	5.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	38.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	18.00
No. 2 bundles	16.00
Machine shop turnings	5.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	35.00-38.00

HAMILTON, ONT.

(Delivered prices)

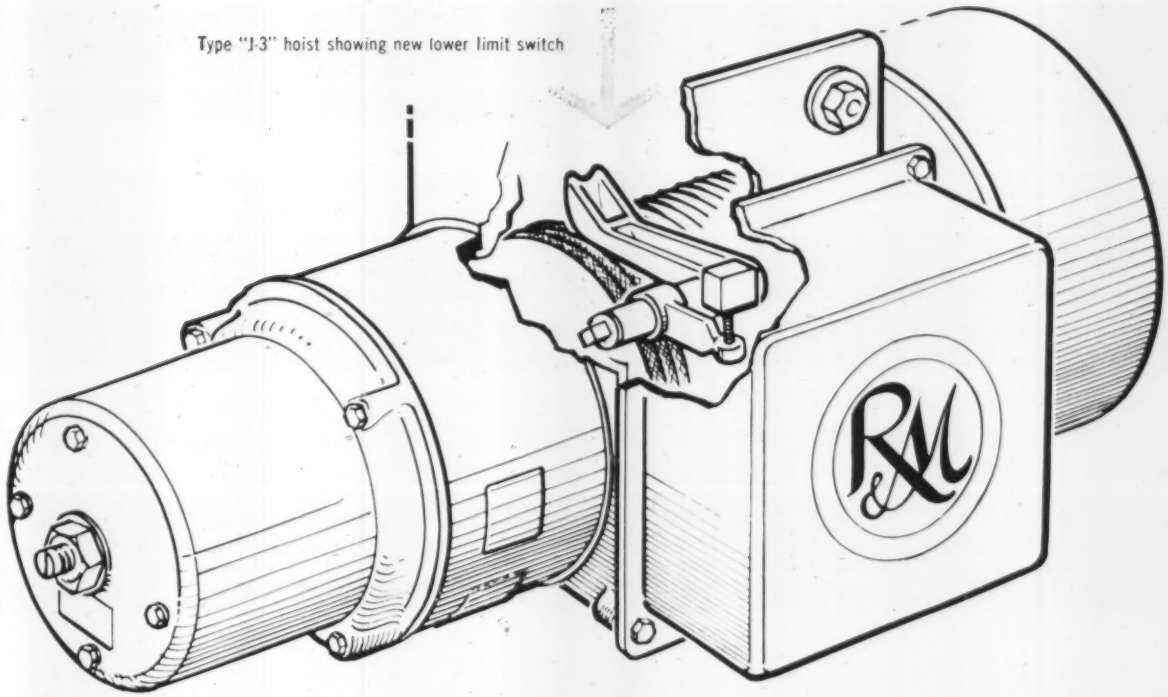
No. 1 heavy melting	$23.00
No. 2 heavy melting	21.00
No. 1 bundles	23.00
No. 2 bundles	18.00
Mixed steel scrap	18.00
Mixed borings, turnings	13.00
Rails, remelting	33.00
Busheling, new factory	
Prepared	22.00
Unprepared	18.00
Short steel turnings	13.00

Cast Iron Gradeat

No. 1 machinery cast	42.00

†F.o.b., shipping point.

Type "J-3" hoist showing new lower limit switch



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That's the Robbins & Myers J-3 electric cable hoist, new from trolley to hook block. Designed to provide maximum economy for your investment, the J-3 fills the gap between lower cost electric chain hoists and costlier heavy-duty models. It's field proven and backed by R&M's reputation for quality. Buy the J-3 for those two-ton handling jobs for which you've wanted the advantages of an electric cable hoist.

Check these features—new lower limit switch leaves two wraps of cable still on the drum, never lets the load hang from the cable anchorage—heat treated alloy steel helical and straight spur gears—machine grooved drum allows 18-foot lift without overwind—cast aluminum alloy frame—anti-friction bearings throughout—two horsepower high torque R&M hoist motor— Weston-type load brake—magnetic disc motor brake—single speed push button control is standard, two speed available—lug mounting, or plain, geared, or motor driven trolley—2000 or 4000 pound capacity models.

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ROBBINS & MYERS, INC.

SPRINGFIELD, OHIO | BRANTFORD, ONT.

clip
staple to letterhead
add name & title

Have representative call ☐

Send J-3 bulletin No. 890 ☐

Steel

(Concluded from Page 157)

market here. Sales were reported to both Canadian and local consumers to substantiate the higher prices. As a result of brisk buying, cast supplies are reported dwindling rapidly.

Meanwhile, steelmaking and blast furnace items remain on the soft side with prices nominally unchanged.

February Steel Output Down

New York—Production of ingots and steel for castings totaled 7,083,000 net tons in February, reports the American Iron & Steel Institute. While down about 868,000 tons from January output, production was at a rate only 100,000 tons less than that in the preceding month because of the fewer days.

The Institute's production index—based on average annual production of the three years 1947 to 1949 as 100—was 110.2 during February. Output for the month was actually 10.2 per cent greater than the average of the three base period years. January output was 11.8 per cent above the base period average. In February a year ago, when production totaled 8,932,779 tons, the index was 139.0.

During February the output of steelmaking furnaces was at an average of 74.3 per cent of rated capacity as of Jan. 1, 1954. Actually, more steel was produced during the month than was produced in February 1950 when the industry operated at 89.2 per cent, but capacity was much smaller than at present. In February last year, the average was 99.1 per cent of the Jan. 1, 1953 capacity, which was 6.8 million tons less than currently.

Comparative data are shown in the accompanying table.

Scrap Yard Dealers Organize New Group

National association formed to provide independent voice in presenting views of yard operators. Proposal for government stockpiling of scrap adopted at New York meeting

New York—A national association of scrap yard dealers has been formed "to provide an effective and independent voice in presenting the point of view of yard dealers in their relations with consumers of scrap, the government and the public." It will be known as the National Federation of Independent Scrap Yard Dealers. Harry Wische, Newark Iron & Metal Co, Inc., Union, N. J., is president.

A proposal for government stockpiling of scrap in the form of ingots was adopted as part of an emergency program to prevent disintegration of the collection and processing machinery of the scrap yards in the best interests of conservation of natural resources and national defense.

Other officers elected at the meeting here, which was attended by yard dealers from 11 states, include: Vice president, George Nutman, Newtown Iron & Steel Corp., Jamaica, N. Y.; secretary, Mrs. J. Monsky, J. Monsky & Co., Middletown, N. Y.; treasurer, Nelson Noble, South Boston Iron & Metal Co., South Boston, Mass.; and chairman of the board, Arnold Weinstein, Independent Scrap Iron Corp., Brooklyn, N. Y.

In addition to the officers, the following are on the board of directors: David Reisner, William Reisner & Co., Clinton, Mass.; Sidney Rockmuller, Steel Scrap Inc., Brooklyn, N. Y.; Aaron Goldstein, New Brunswick Iron & Metal Co., New Brunswick, N. J.; A. Hamelsky, Independent Iron & Metal Co., New Brunswick, N. J.; Edward J. Laskin, Consolidated Iron & Metal Co., Newburgh, N. Y.; and Abraham Effron, Charles Effron & Son, Poughkeepsie, N. Y.

The officers and board were authorized to undertake a program to recapture lost scrap markets and increase the use of scrap as a raw material; to establish guarantees of quality, tonnage and performance; and to formulate a fair trade practices program aimed at preserving free and fair competition within the industry, improving relations with consumers and scrap brokers and encouraging sound merchandising principles. Foreign markets, banking and trade paper quotations were also to be included in the program.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 155

Washington—Production of coke in the U. S. totaled 5,812,426 tons in January, 1954, the Bureau of Mines reports. This marked a decrease of almost 5 per cent from December output and was 14 per cent less than January 1953 production.

Blast furnaces showed a sharp decline in operating rate, says the Bureau.

Period	OPEN HEARTH Net tons	OPEN HEARTH Per cent of capacity	OPEN HEARTH ‡Index	BESSEMER Net tons	BESSEMER Per cent of capacity	BESSEMER ‡Index	ELECTRIC Net tons	ELECTRIC Per cent of capacity	ELECTRIC ‡Index	TOTAL Net tons	TOTAL Per cent of capacity	TOTAL ‡Index	Calculated weekly production (Net tons)	Number of weeks in month
1954														
*January	7,256,526	78.3	113.3	260,453	64.0	74.1	434,507	48.9	121.7	7,951,486	75.3	111.8	1,794,918	4.43
‡February	6,521,000	77.9	112.7	174,000	47.4	54.8	388,000	48.4	120.3	7,083,000	74.3	110.2	1,771,000	4.00
1953														
January	8,841,679	101.4	138.0	350,200	88.9	99.7	706,083	81.2	197.7	9,897,962	99.1	139.1	2,234,303	4.43
February	7,939,296	100.8	137.2	329,389	92.6	103.8	664,091	84.6	205.9	8,932,779	99.1	139.0	2,233,195	4.00
March	9,050,773	103.7	141.3	354,710	90.0	101.0	762,615	87.7	213.5	10,168,098	101.8	142.9	2,295,282	4.43
1st Qtr.	25,831,751	102.0	138.9	1,034,299	90.4	101.4	2,132,789	84.5	205.7	28,998,839	100.0	140.4	2,254,964	12.86
April	8,493,909	100.5	137.0	334,605	87.7	98.4	717,024	85.2	207.4	9,545,538	98.7	138.7	2,225,067	4.29
May	8,925,163	102.3	139.3	354,577	90.0	100.9	717,340	82.5	200.8	9,997,080	100.1	140.5	2,256,677	4.43
June	8,394,502	99.4	135.4	332,060	87.0	97.7	677,917	80.5	196.1	9,404,479	97.2	136.6	2,192,186	4.29
2nd Qtr.	25,813,574	100.8	137.3	1,021,242	88.3	99.0	2,112,281	82.7	201.5	28,947,097	98.7	138.6	2,224,988	13.01
1st 6 mos.	51,645,325	101.4	138.1	2,055,541	89.3	100.2	4,245,070	83.6	203.6	57,945,936	99.4	139.5	2,239,889	25.87
July	8,316,342	95.5	129.8	324,068	82.4	92.2	635,263	73.2	177.9	9,275,673	93.1	130.4	2,098,569	4.42
August	8,463,155	97.0	132.1	310,074	78.7	88.2	632,551	72.7	177.0	9,405,780	94.2	132.2	2,123,156	4.43
September	8,076,277	95.8	130.3	287,638	75.6	84.6	539,513	61.9	150.3	8,883,428	92.1	129.0	2,075,567	4.28
3rd Qtr.	24,855,774	96.1	130.8	921,780	78.9	88.4	1,787,127	69.4	168.6	27,564,881	93.1	130.6	2,099,366	13.13
9 mos.	76,501,099	99.6	135.6	2,977,321	85.8	96.2	6,032,197	78.8	191.8	85,510,617	97.3	136.5	2,192,580	39.00
October	8,648,428	99.1	135.0	325,250	82.6	92.6	476,044	56.3	136.9	9,462,722	94.7	133.0	2,136,055	4.43
*November	8,002,349	94.7	129.1	283,321	74.3	83.3	401,382	48.0	117.0	8,690,052	89.9	126.2	2,025,653	4.29
*December	7,321,947	84.1	114.3	269,813	68.6	76.8	354,568	40.9	99.3	7,946,328	79.7	111.7	1,797,812	4.42
*4th Qtr.	23,972,724	92.6	126.1	878,384	75.2	84.2	1,247,994	48.4	117.7	26,099,102	88.1	123.6	1,986,233	13.14
*2nd 6 mos.	48,828,498	94.4	128.4	1,800,164	77.1	86.3	3,035,121	58.9	143.2	53,663,783	90.6	127.1	2,042,778	26.27
*Total	100,473,823	97.9	133.2	3,855,705	83.2	93.2	7,280,191	71.1	173.1	111,609,719	94.9	133.2	2,140,578	52.14

Note: The percentages of capacity operated are calculated on weekly capacities in 1954 of 2,092,342 net tons open hearth, 91,810 net tons bessemer and 200,397 net tons electric ingots and steel for castings, total 2,384,549 net tons;-based on annual capacities as of Jan. 1, 1954 as follows: Open hearth 109,094,730 net tons, bessemer 4,787,000 net tons, electric 10,448,680 net tons, total 124,330,410 net tons.

Note: The percentages of capacity operated are calculated on weekly capacities in 1953 of 1,969,275 net tons open hearth, 88,934 net tons bessemer and 196,240 net tons electric ingots and steel for castings, total 2,254,459 net tons, based on annual capacities as of Jan. 1, 1953 as follows: Open hearth 102,677,980 net tons, bessemer 4,637,000 net tons, electric 10,232,490 net tons, total 117,547,470 net tons.

*Revised. ‡Preliminary figures, subject to revision. ‡Index of production based on average annual production of the three years 1947-1948-1949.

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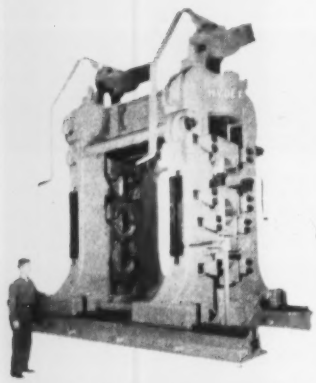

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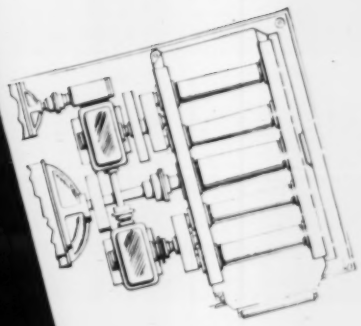

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